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ABSTRACT

This guidebook provides an empirically-based set of planning and design guidelines for the construction of winter play facilities for Canadian youth residing in locations where outdoor play in winter is curtailed for approximately 4 months of the year. Information used in developing the guidelines was derived from field observations, a literature review, and a field experiment. Contents of the first six parts of the volume briefly describe and discuss the field experiment, romantic responses to and realistic aspects of winter, the nature of play and children's need for play, the response of children to winter on the Canadian prairie, and a preliminary test of design guidelines. The seventh part presents guidelines for developing winter play areas. Guidelines are provided for site planning, design, and activities, and for play structures, mounds, plant material and playground surfaces. Substantially more than half of the guidebook consists of four workbooks: Workbook One describes physical aspects of winter; Workbook Two reports observations of children's responses to winter; Workbook Three provides design notes for a school winter playground; and Workbook Four provides basic information about seasonal plants that could be used in environmental education activities. In conclusion, a brief review of related literature is provided. (RH)

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CHILDREN'S ENVIRONMENTS ADVISORY SERVICE

RESEARCH AND DEVELOPMENT PROGRAM

International Year of the Child 1979

L'Année internationale de l'enfant 1979

CMHC's participation in the International Year of the Child.

PRAIRIE WINTER PLAY PATTERNS

(b) WINTER and PLAY

Research project 10

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WINTER AND PLAY

WINTER AND PLAY:

Design Guidelines for Winter Play Environments on the Canadian Prairie

Charles H. Thomsen

Alexandra Borowiecka

International Year of the Child 1979

L'Année internationale de l'enfant 1979

This project was supported by the Canada Mortgage
and Housing Corporation as part of the research program
undertaken by the Children's Environments Advisory
Service for the International Year of the Child

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PREFACE

The Children's Environments Advisory Service's Research and Development Program for the International Year of the Child has as its objective the advancement of good environmental planning and appropriate family housing design that supports the needs of children and youth (0-18).

An in-house CMHC IYC Committee, consisting of representatives of various CMHC divisions that impact on family housing and regional representatives, identified the gaps in the field. The committee selected projects of directed research to close these gaps and identify problem areas, to find solutions where possible, and to provide input to corporate policy and programs in the field of family housing. Five categories of investigation were selected to respond to these needs:

- Assembly/Production of Data

  To assemble a data bank on the condition of children in relation to their residential environment and to relate this data to data being collected by other departments and agencies.

- Evaluation

  To examine existing housing situation catering to the needs of families with children at home.

- Design and Awareness Material

  To develop proposals for improving housing and the surrounding environment through design.

- Demonstration

  To construct demonstration facilities for children, or to introduce improved facilities for children in on-going projects.

- Development of Policy Proposals

  To review the condition of children in Canada, and present proposals to meet or correct emerging problems in relation to housing.

The CMHC IYC Committee will develop for CMHC Management a policy paper based on the facts, figures and findings of the Research and Development Program for IYC, with implications for future policy, programs and research affecting family housing.

The Children's Environments Advisory Service plans to use the focus on children made possible by the Year of the Child to plan new directions for our service. We intend to conduct further research, provide additional resources and sustain the momentum of our advocacy role within CMHC.

This project is one of 21 projects (titles on last page) in the Research and Development Program for the International Year of the Child. These reports are distributed by the Children's Environments Advisory Service.

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ABSTRACT

DESIGN GUIDELINES FOR WINTER PLAY ENVIRONMENTS ON THE CANADIAN PRAIRIE

ABSTRACT

Winter on the Canadian Prairie occupies a time period almost equal to three seasons of the year. This period, although somewhat moderated at either end, contains four months of severe climatic conditions in which outdoor play is virtually curtailed.

Although much research and documentation of planning and design criteria has occurred for summer play facilities, the real need on the prairies is the development of criteria for the design of winter play facilities. The purpose of this study is to develop a set of planning and design guidelines which are more responsive to such winter environmental factors as sun and wind exposures, snow textures and depths, temperatures, and landforms.

Information for the development of the guidelines was derived from field observations, a literature review, and a field experiment.

ACKNOWL-EDGEMENTS

ACKNOWLEDGEMENTS

This project was carried out jointly between Central Mortgage and Housing Corporation and the Department of Landscape Architecture, University of Manitoba. The research was conducted by Master's students in Landscape Architecture under the direction of Assistant Professor Charles H. Thomsen who acted as principal investigator and co-ordinator of the final research report.

Students who participated in the research were: Norbert L. Badiou, Gordon W. Bone, James P. Lai, Barbara L. Magee, Robert A. Marchak, D.James Paterson, Dean J. Spearman, Ingrid A. Thiessen, Henry A. Veenhoven, and Thomas P. Llewellin.

A special thanks goes to Alexandra Borowiecka, who served as research assistant, putting up with the many hours of writing and re-writing, and who lent to this study her poetic perceptions, especially in the section on the 'Romance of Winter'.

Thanks also goes to Dr. Robert W. Newbury, who was of considerable assistance in giving us needed direction with the technical aspects of the winter physical factors.

Appreciation is also given to the typists of this study: Mrs. Anne Devlin and Mrs. Evelyn Keele.

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A STUDY OF WINTER PLAY

PART 1: A STUDY OF WINTER PLAY ON THE PRAIRIES

1.1 THE PROBLEM

Winter on the Canadian Prairie occupies a time period almost equal to three seasons of the year. This period, although somewhat moderated at either end, contains four months of severe climatic conditions in which outdoor play is virtually curtailed.

For many living on the prairies, winter is a time they would much rather be somewhere else; some tropical paradise or land of warm fantasy. For them, it is a time for retreating indoors and growing bored with artificial forms of entertainment. For a child, this is disasterous for they fail to realize the full potential of a rich and diverse environment, as well as fail to learn to deal effectively with realities of the natural world about them.

> *"The outdoors is always an educative environment, sometimes positive, sometimes negative." p. 2*
>
> *Peggy L. Miller, Creative Outdoor Play Areas. Englewood Cliffs, N.J., 1972.*

The Prairie winter months provide the opportunity and resources for rich and stimulating forms of play absent in the summer environment. The loose parts of adventure play are all around and there are new and changing environments to be explored. There is a greater opportunity for children to create their own play situations, and they are no longer limited to what is provided for them in the traditional playground. Snow piled high at the side of the road is a mountain to be climbed or moulded into the endless forms conjured by the imagination. Hard packed snow, polished smooth by traffic on streets and walkways, serves as ideal hockey rinks or sliding areas. There is a new found freedom in the way the environment can be and is used. The snow transforms whole neighborhoods into adventure playgrounds.

> *"I came to places where the wind had its moments of frolicsome humour, when it had made grim fun of its own massive and cumbersome and yet so pliable and elastic majesty. It had turned around and around, running with breathless speed, with its tongue lolling out, as it were, and probably yapping and snapping in mocking mimicry of a pup trying to catch its tail; and it had scooped out a spiral trough with overhanging rim. I felt sorry that I had not been there to watch it, because after all, what I saw was only the dead record of something that had been very much alive and vociferatingly noisy." p. 81-82*
>
> *Frederick Philip Grove, Over Prairie Trails. (Toronto: McClelland and Stewart Limited, 1957).*

Despite this apparent freedom, there is a real need to develop a set of guidelines for winter play facilities. These guidelines could be used by planners and designers for the modification of already built environments, as well as the development of new living environments which would make them more responsive to the needs of children during the winter months.

Present Canada Mortgage and Housing Corporation planning and design guidelines deal almost exclusively with summer related activity and the existing outdoor play facilities associated with housing projects are sadly underutilized during the long winter months. This has placed a heavy burden on the living accommodations in terms of their physical capacity and on the stress levels of the family unit.

"Rather than helping young people to learn to live in harmony with the outdoors during the variety of seasons, to enjoy playing in the snow as well as in the summer sunshine, most adults teach children that the outdoors is a place to be used and enjoyed only at certain times of the year, in certain weather conditions, at certain times of the day." p. 13

Peggy L. Miller, Creative Outdoor Play Areas. Englewood Cliffs, N.J., 1972.

Although much research and documentation of design criteria has occurred for summer play facilities, there are few guidelines for winter play facilities. Little is really documented or known about users responses to varying sun and wind exposures, varying snow textures (light, fluffy, first snowfall; hard packed snow resulting from trampling or freeze-thaw cycles) or depths, or the decreased length of daylight hours. Each of these environmental factors has an influence on winter play opportunities on the Canadian Prairie.

1.2 THE OBJECTIVES

It is the objective of this study to analyze the apparent and hidden responses of children to winter environmental factors (such as climate, landform, plants, ice and snow) in terms of their influence on the patterns of childrens' play. Further, it is the objective to then synthesize and document from this data the design guidelines necessary for the successful design and fabrication of winter play facilities.

This is in no way a comprehensive study of the interrelationship between childrens' play and the winter environment, but it does present a valuable and needed first step in outlining the necessary planning and design guidelines.

1.3 THE METHODS

To aid in our development of design criteria for winter play facilities a number of structured and unstructured observations were made at housing and school playground sites in the Winnipeg area. Of the structured observations two housing areas and one school playground were selected as more detailed study areas. As it has been the pattern for most pre-schoolers to be kept indoors during the most severe winter months, the observations focused on the elementary school aged children. The schedules for observations were largely based upon changes in environmental conditions (i.e., severe cold wave, warming trend, fresh snow, or strong winds) rather than at specific time intervals over the winter months. The information gathered from these observations is summarized in Parts 5 and 6 with a more complete written documentation in Workbooks Two and Three. These observations together with discussions with selected children and teachers, and a review of current literature comprise the background information used in developing the design guidelines for winter play facilities.

The format for this final document is such that the Workbook sections can be removed and used separately according to individual or special interests. They contain more detailed information on the topics discussed in the main text and were used in formulating the guidelines.

This is not a study of indoor facilities although that is a viable alternative to outdoor play and an area of potential future research development. It is hoped that with this study ways have been identified by which individuals can better use and enjoy the outdoors, not hibernate away from it!

ROMANCE

PART 2: THE ROMANCE OF WINTER

2.1 THE POETIC RESPONSES

Many people view winter as an ugly frog waiting to be kissed and changed into the prince of spring. A common allegory portrays winter as death, as harsh and uncompromising. The end of winter signals a revival of hope, while the middle is an unspeakable time of nothingness.

This "night of the year" that we call winter does have the distinction of being at the end of one year and the beginning of the next. It knows us well, our virtues and our faults. It knows of our complaining about shovelling driveways, scraping ice, having your breath taken away by the cold. It knows of our sometime indifference, our attitude that winter is a necessary evil, a season that has to be plodded through. It knows of our affection for it born with each first snowfall. Winter exists as does a piece of poetry, as a magnifying lens giving a better understanding of the life principles lying hidden within it.

And there is an amazing amount of life in winter. Although it lies under the ice and in the warmth of the ground, it is a life that comes of the confidence that this is a healthy suspension of activity. This is like going on a holiday and not having to worry about day to day affairs. Winter lacks some of the frantic aspects of summer. It is a time to sit back and reflect.

And yet the history of settlement on the Prairies is partly a history of surviving winters; winters which left people dead and frozen, clinging to fences within view of their homes. Prairie souls are possessed by winter. It is one thing we can be sure of.

Winter on the prairies moulds our perception of the land. It is a season with a richness that is at once beautiful and lonely. The horizontal eternity that is the prairies strengthens the relationship of man to his land. Winter on the prairies encompasses the large scale and the small scale, from the ocean - like waves of whiteness, to the odd piece of prairie grass trying to keep its

"Winter folds a velvet ear
and summer's silk of corn
reflects in autumn's russet eye
the skeleton of a thorn." p. 97

The National Film Board of Canada, Call Them Canadians, poems by Miriom Waddington.

"and winter holds his breath of snow
in autumn's poker mouth." p. 97

The National Film Board of Canada, Call Them Canadians, poems by Miriom Waddington.

"Ice fishermen posted on snow-covered lakes know they are waiting only inches over a summer world for warm-water pickerel to strike their bait and spri the red flags of their tip-ups." p. 3

John W. Miller, "Knowing Ice", Audubon, January, 1980, Vol. 8 No. 1.

"After the summer may be there is some kind of solace for the spirit in the snow and ice."

Morley Callaghan and John de Vis Winter, Toronto: McClelland a Stewart Limited, 1974.

head above the snow.

The light of a prairie winter has a special quality with the intense blue of the sky sitting lightly on a white land, and with the leafless branches finding a second life in their shadows against the snow.

It is this second life that winter gives us also. We have only to be willing to take it.

And this is where we can learn from children. For theirs is a world that does not make a sharp distinction between times of year; theirs is a world of imaginings that hungrily and happily accepts a winter with none of the qualifications or disgruntlement of adults.

Morley Callaghan has said " . . . Kids use the winter. They play with it. Winter happiness seems to come to those who know how to use this season."[1] Where there was flatness there is suddenly the potential for cragged mountain peaks. Where there were paths, grass, dirt, there is now the potential for making unlimited changes, for developing new paths, for marking new boundaries. Riding a sled standing up is like surfing on some eternal wave. Where before a pond was for swimming it is now possible to walk on it, to skate across it. A new environment arises from the fertile ashes that were autumn, an environment formed gradually, that changes everyday, that acquires a special beauty when a child in a brightly coloured snowsuit appears, with the coloured cheeks that come of the cold, health, and exuberance.

When you go to bed one night to the chilled brown of an autumn landscape and wake up the next morning to a light and white land, that really is a cause for celebration. This is a situation that demands putting on boots and coat hurriedly and making the new snow feel welcome.

This snow, this blanket that is suddenly pulled over a sleeping earth by a benevolent sky is an amazing material. Falling, it can land in the curve of your eyelashes giving the world a huge white blur, or it can slip off your cheek leaving behind a tiny drop of moisture, or when it lands on

"And, come to think of it, that old man I used to watch when I was a boy, the man who came out late at night and shavelled his neighbors' sidewalks, that man who bewildered us all, maybe in his own way he had been touched by this mild night city snow magic, as my dog was now, rollicking wildly on the corner under the street light."

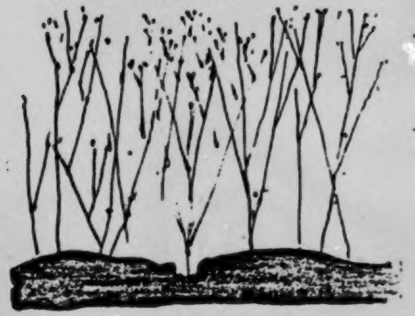
Morley Callaghan and John de Visser: Winter, Toronto: McClelland and Stewart Limited, 1974.

"Ice holds on to life right up to its last black inches. Lift it out of the water and it drains silver with honeycombs, falls apart under its own weight. p. 39

John W. Miller, "Knowing Ice", Audubon, January, 1980, Vol. 81, No. 1.

"How much closer to a man's moods and his longing for mystery is the feeling that comes watching the winter change, the entry into that other winter."

Morley Callaghan and John de Visser: Winter, Toronto: McClelland and Stewart Limited, 1974.



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[1] *Morely Callaghan and John de Visser, Winter, Toronto: McClelland and Stewart Limited, 1974.*

your mitt you can watch it dance into disappearing.

Winter has its own brand of sounds too. The whiteness seems to intensify talking, laughing, shouting. They are different sounds than in the summer. Sometimes they are carried on top of the howling wind, sometimes in the footsteps in the snow at night. Sometimes they are so clear and crisp, they are like slivers of diamond ice being propelled through the air and lost somewhere in the sky.

"Today, however, they all lent their stalks to support the hoarfrost, to double and quadruple its total mass. They were powdered over with countless diamonds." p. 57

Frederick Philip Grove, Over Prairie Trails. (Toronto: McClelland and Stewart Limited, 1957).

Amidst all that coldness though, the sun can warm an upturned face until it becomes one big red freckled smile with amazing images floating behind the eyes.

2.2 REFERENCES

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REALITIES

PART 3: THE REALITIES OF WINTER: ITS PHYSICAL FACTORS

3.1 INTRODUCTION

In designing play environments that can be used in all seasons one could approach the situation by attempting to control physical factors through protection and/or elimination. But one can move beyond this creation of shells to the position of using these physical factors to develop a richer play environment - e.g. admitting sunlight to produce shadows, or having special places for listening to the sounds of the wind. It is like not worrying about getting out of the rainstorm, but trying to find a place where the raindrops will make a special sound.

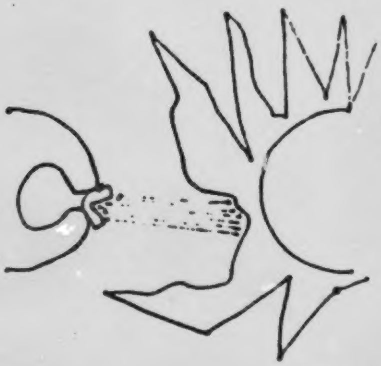
For this reason, some basic mechanisms have been outlined, so that one can approach each factor and each situation individually. As with a friend one should be sensitive to their vagaries. Of ultimate importance in design will be the relationships of wind, snow, solar radiation, and ice. These physical factors have been described through those characteristics that would affect the design of a playground. Additional information is included in Workbook One.

> *"Also the cold climate has aspects that are experienced as positive. First of all, there is a great range of temperatur and weather conditions over the year. The clear demarcation of the seasonal rhythm provides a psychologically significant experience of nature and life. . . .* *p. 69*
>
> *Boris Culjat, Climate and the Buil Environment in the North. (Swe Arkitektursektionens Tryckeri, KT 1975.*

> *"The winter, with its snow and ice, is not an evil to be corrected. It is as it was designed and made to be, for the artist has had leisure to add beauty to use." p. 71*
>
> *Henry David Thoreau quoted in Cather M. Young, To See our World, GLC Publishers Limited, 1979*

3.2 WIND

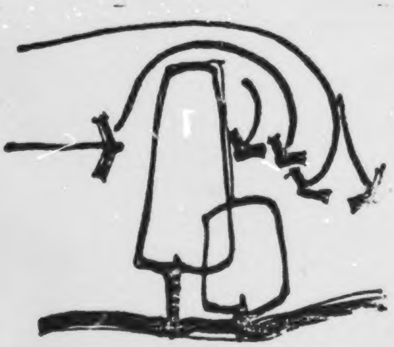
In the old story of the sun and the wind mightily trying to outdo each other in forcing a man to take off his cloak, the sun won the contest through the gentle intensity of heat. The howling and blustering of the wind forced the man only to pull the cloak tighter about him.



And that is how we approach the wind. We tighten our cloaks and put up solid walls. However, solid walls can create more problems than they solve. There are other ways of approaching the wind and its effect on the microclimate.

On a world-wide scale wind is produced by variations in the density of the atmospheric mass. This occurs largely through an uneven distribution of the sun's heat on the surface of the earth. On a smaller scale the wind may be a modification of these larger scale movements or may be an air movement set up by elements of that locale - the presence of water, vegetation, or certain topographical features.

The immediate surrounds of an area - trees, shrubs, walks, fences, buildings - can create high and low pressure areas. The introduction of a rough barrier into the airflow will result in the formation of a pressure eddy in front of the barrier and a suction eddy leeward of it (in the case of a solid wall, because the wind cannot pass through, the air currents passing over are forced downward creating an intense suction effect). A barrier affects wind over a distance of from two to five times the height in front and from ten to fifteen times leeward.



In one study of fences[1], it was shown that a slat fence with slats spaced 1½" apart had the lowest temperature reading close to the fence. The highest reading occurred at a distance of three times the height of the fence. That wind which did not go over the top went through the slats and was dissipated by them. The slow moving air then protected the area from the faster moving air.

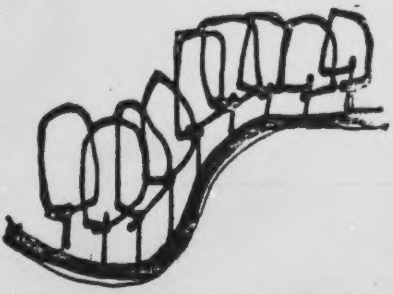
In this same study it was found that a baffle added to the top of a solid wall helped to smooth the air flow (especially with the baffle slanted away from the wind.)

Directing winds out of certain areas and into others aids not only protection, but also ventilation. The diagrams on the following page will illustrate the ways in which wind moves about certain obstructions.

There are therefore a number of basic considerations to follow when designing winter play areas:

MODIFY WINTER WIND:

- Orient activities to avoid winter winds (and channel summer breezes).
- Provide semi-enclosed outdoor areas.
- Screen out winds through use of vegetation, landforms, fences.



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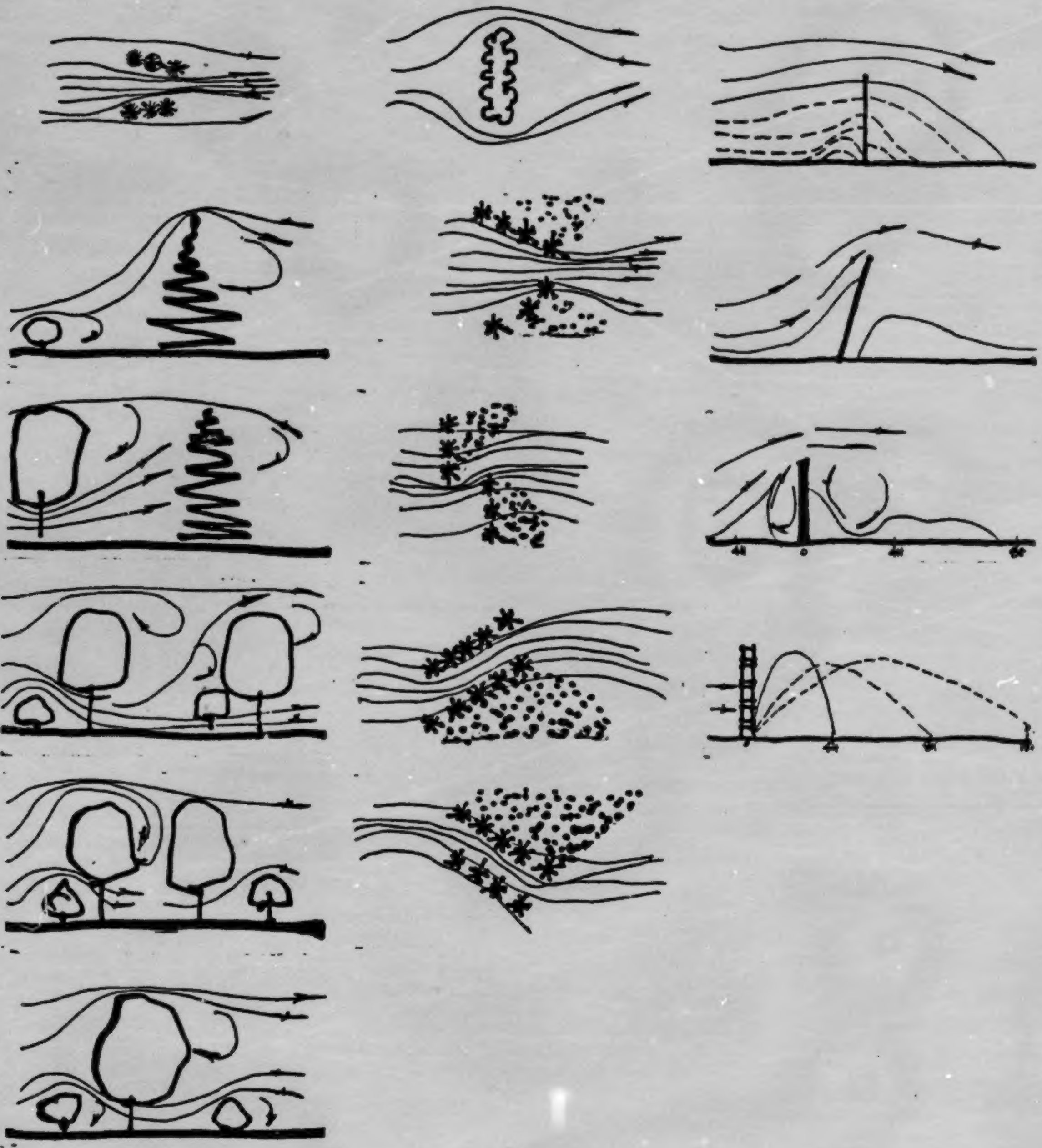
[1] Sunset Books, *How to Build Fences and Gates*.



3-3

- Channel winds through use of vegetation, and/or landforms.
- "A dense coniferous windbreak of pyramidal arbornitae on the northwest side of a structure may protect it from the harsh winter winds, and yet direct summer breezes around it."[2]
- Use screening vegetation in the creation of outdoor spaces.

3.3 SNOW

The life of snow follows a varied route. Autumn, a time of temporary snow cover, is followed by a season of stabilized cover. The spring thaw brings discoloration and an eventual disappearance of the permanent cover.

> *"The inhabitant of the middle lattitude of this continent has no data to pictur to himself what a snowstorm in the nort may be. To him snow is something benig that comes soft-footedly over night, an on the most silent wings like an owl, something that suggests the sleep of Nature rather than its battles." p. 6*
>
> *Frederick Philip Grove, Over Prairie Trails. (Toronto: McClelland and Stewart Limited, 1957).*

The terminology used by northern peoples to describe those various snow covers occurring under different conditions, and having consequences for their activities, serves to give us a poetry of snow which our language does not accommodate. The "snow that collects on trees" (QUALI) is important in the lives of the Red Squirrel, Marten, and other birds, as is the "bowl-shaped depression in snow around the base of trees" (QAMINIQ). Snow can be "snow on the ground" (API), "wind-beaten snow" (UPSIK), "smoky or drifting snow" (SIQOQ), a "smooth snow surface of very fine particles" (SALUMA ROAQ) or a "rough snow surface of large particles" (NATATGONAQ).[1]

With snow as the given material we could approach it by just deciding to clear it away. Actually, our manipulation of it can be a bit more sophisticated. Several characteristics are important in these considerations: reflectivity, heat conductivity, density, toughness, and its thawing characteristics.

> *"Why do the vast snow plains give us pleasure, the twilight of the bent and half-buried woods? Is not all there consonant with virtue, justice, purity, courage, magnanimity?" p. 46*
>
> *Henry David Thoreau quoted in Catheri N. Young, To See our World, GLC Publishers Limited, 1979.*

One of the properties of snow that is most evident and that everyone has had direct experience with is that of its reflective powers. Seventy to ninety-five per cent of the solar energy falling on snow is reflected. Old compacted snow reflects only 30 - 50%, and wet snow even less. With the imminent thaw of spring, dust and soot also diminish the power of snow to reflect the sun. Visibility in winter increases with the snowfalls of late autumn creating nights illuminated by light of a very magical quality. During the day, shadows are particularly visible.

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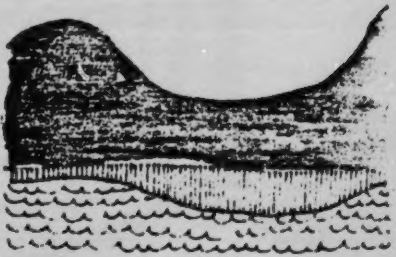
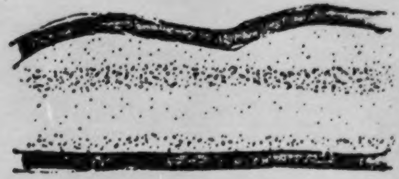
[2] *Gary O.Robinette, Editor, Landscape Planning for Energy Conservation, Reston, Virginia: Environmental Desig Press, 1977, p. 37.*

[1] *William O. Pruitt, Jr., "Life in the Snow," Manitoba Nature, Winter 1973,*

The heat conductivity of snow is poor. It has good insulating qualities, preventing heat from leaving the soil and cold from leaving the atmosphere. This can result in unfrozen soil. The presence of a snow cover over a water area also prevents the formation of a thicker coat of ice. Dense snow has better heat conductivity than loose snow, with ice possessing a heat conductivity about 12% better than that of snow.



The density of snow (the proportion of the quantity of water obtained from snow to the amount of snow being examined) changes throughout the season. The density of freshly fallen, loose snow increases after a thaw or rainfall. Successive increases and decreases create a layering of loose and compact snow. The density of snow varies through the season, reaching its minimum in January. As successive freezing and thawing compacts the snow, maximum density occurs in the spring.



The bearing capacity, or toughness, of snow does not always depend on its density. With a rise in temperature, and thawing, the water increases the density, but the snow becomes brittle and less cohesive. Spring snow is very compact, but not very tough. The toughness of snow depends on the process of recrystallization, which is at its best when the snowflakes have been loosened up. Since snow is strongest with this realignment of crystals the snow used for building should be restructured. This can be accomplished simply by piling the snow and allowing it to set.

"If you look at some small drift piled up against the glass pane of a storm window, you can plainly see how the sno even in such a miniature pile, preserv the stratified appearance which is the consequence of its being laid down in layers of varying density." p. 106

Frederick Philip Grove, Over Prairie Trails. (Toronto: McClelland and Stewart Limited, 1957).

The process of thawing, being a time of changes, can be manipulated in a variety of ways. During early periods of thaw dark objects which have fallen into the snow absorb more heat than the snow itself, and the area immediately adjacent to the objects often thaws right through to the ground. Similarily, deep craters form in the snow around tree trunks, whose dark bark radiates absorbed solar energy into the snow surrounding the tree. Snow sprayed with cinders absorbs 2.8

"Ere long the frost comes out of the grou like a dormant quadruped from its burrow and migrates to other climes in clouds. Thaw with his gentle persuasion is more powerful than Thor with his hammer. The one melts, the other but breaks in pieces." p. 77

Henry David Thoreau quoted in Catheri M. Young, To See our World, GLC Pub lishers Limited, 1979.

times more heat than clean snow.[1] The colouring of snow with a dye also accomplishes the same end, but only in the initial stages of thawing, when the direct heating power of the sun is of prime importance. During the later stages of spring when thawing depends also on the heat content of the air it is in the light and clean portions of the snow where the most advanced and intensified thawing takes place. The presence of soil particles slows down the process of thawing.

The uneven distribution of snow also has an effect on the rate of snow melt. When the winter has been windy and snow has been moved around, melting is bound to begin in some places sooner than in others. The heat absorbed by these areas contributes to the thawing process. A cover of least thickness, usually, occurs on the top most parts of slight elevations and steep slopes directly exposed to the wind.

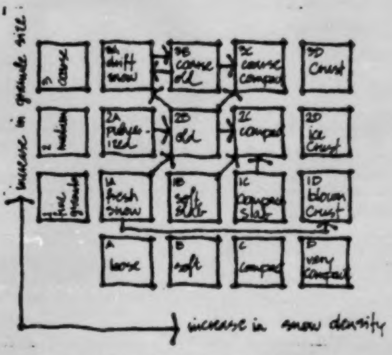
Intensity of snow thawing also depends on the speed with which the water produced by melting snow runs off. The water at first saturates the top layer of snow, then moves horizontally on top of one of the more solid layers of ice crust buried in the snow. During rapid thawing when snow becomes granular, the water begins to flow directly to the ground in a vertical path. In areas of snow cover where the soil has not frozen, thaw waters are absorbed by the soil. In those areas where soil has frozen (because of a late snow cover or none at all) the thaw waters run off. Ramparts of snow can be established where the flow of water will be stopped and absorbed by the ground.

Another consideration is that of ground cover. The rate of melting over short grass has been shown to be greater than that over longer grass.[2] This occurs because the longer grass acts as a better insulator. With the short grass there is better thermal contact between the soil surface and the base of the snow.

Much of the beauty of snow lies in it being such a changeable material; an invaluable quality in a play environment. Design objectives should provide for these changes.

"When the snow reached its extreme in depth, it gave you the feeling which a drawning man may have, when fighting hi desperate fight with the salty waves. . The waves of the ocean rise up and rear out and batter against the rocks and battlements of the shore, retreating again and ever returning to the assault covering the obstacles thrown in the way of their progress with thin sheets of licking tongues at least." p. 77

Frederick Philip Grove, Over Prairie Trails. (Toronto: McClelland and Stewart Limited, 1957).



G.D. Richter, Snow Cover, Its Formation and Properties. Moscow: Publishing House of the Academy of Science, 1945.

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[1] *G.D. Richter, Snow Cover, Its Formation and Properties, Moscow: Publishing House of the Academy of Science, 1945, p. 71.*

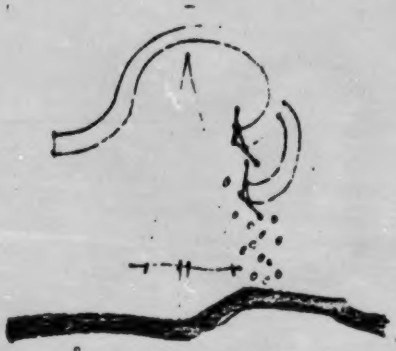
[2] *Keith Smith, Principles of Applied Climatology. London: McGraw-Hill, 1975, p. 34.*

3.4 WIND AND SNOW

"The wind plays stange pranks with snow; snow is the most plastic medium it has to mould into images and symbols of its moods . . . in every case there had been two walls, as it were, of furious blow, and between the two a lane of comparative calm, caused by the shelter of a clump of brush or weeds, in which the snow had taken refuge from the wind's rough and savage play. Between these capes of snow there was an occasional bare patch of clean swept ground. Altogether there was an impression of barren, wild, bitter-cold windiness about the aspect that did not fail to awe my mind; it looked inhospitable, merciless, and cruelly playful".[1]

In the city on rare occasions the wind and snow join forces to present just such a face. Usually, however, this is mitigated by the presence of structures and what does happen is that the snow collects in places where it creates minor annoyances and irritations, (in doorways, on roadways) and does not collect in places where it might be useful (for insulation of plant life and buildings or for the creation of play mounds).

Although we cannot control it completely, we can guide it partially; gently persuading it to move in certain directions. By understanding that a physical obstruction will cause the wind flow to become a number of turbulent air zones on the leeward side of an object, we can manipulate the wind and cause a lower velocity and release of the snow from its encounter with the wind.



The presence of an obstacle will cause the snow to collect around it in drifts of varying configurations. The drifts then "seek to fill in the area of turbulence created by the obstacle, bury it, and form an aerodynamically smooth surface over which the wind can flow smoothly again. They seek, in other words, to streamline themselves."[2]

Snow falling in calm weather usually assumes the shape of objects where it accumulates. With wind, a triangular snowdrift is stretched out on the leeward side of trees, shrubs, or clusters of grass. A row of tall weeds acts as a natural snow trap and produces a drift on its leeward side as would a snow fence. A denser fence will create a shorter drift, while the height of a fence is directly related to the length of a drift.[3] "The rule of thumb is that a standard snow fence of 53% porosity will form a drift on its leeward side 10 times as long as the fence is tall. Thus a 4 foot high fence will develop a drift next to itself extending 40 feet toward the protected area, a five foot fence a drift 50 feet long, and so forth".[4]

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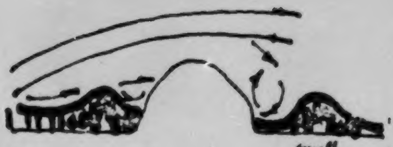
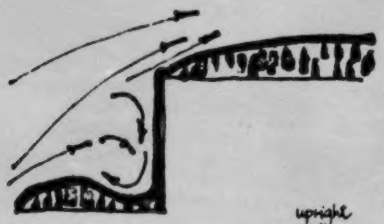
[1] *F.P. Grove, Over Prairie Trails, Toronto: McClelland and Stewart Limited, 1957, p. 68.*

[2] *Harrowsmith Staff Report, "The Best Defence is a Good Snow Fence," Harrowsmith, December 1979, p. 69.*

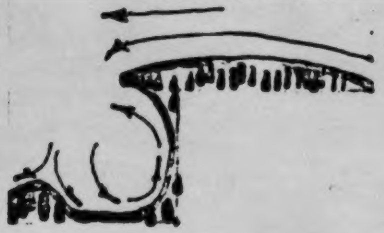


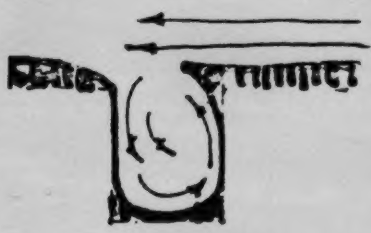
small isolated elevation

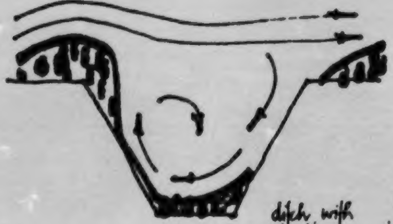
The accompanying illustrations show the drifting patterns arising in different situations.



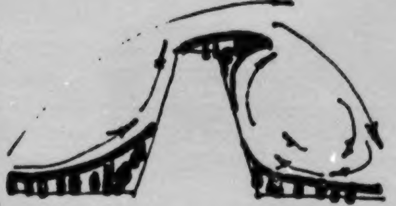
upright wall facing wind



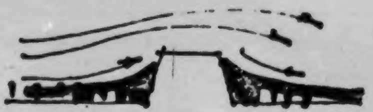




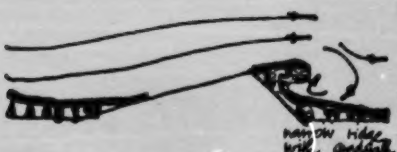
ditch with slanting sides



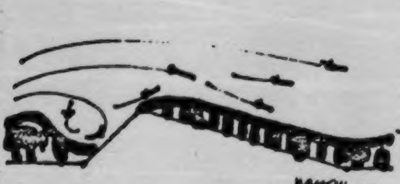
high ridge



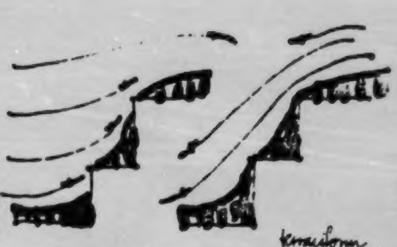
low ridge with slopes of equal size



narrow ridge with gradually inclined slope facing wind



narrow ridge with steep slope exposed to wind



terraceform ledges on slopes

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[4] G.D. Richter, Snow Cover, Its Formation and Properties. Moscow: Publishing House of the Academy of Science, 1945, p.63.

[3] *Ibid*, p. 71.

[4] *Ibid*, p. 71.

3.5 SOLAR RADIATION

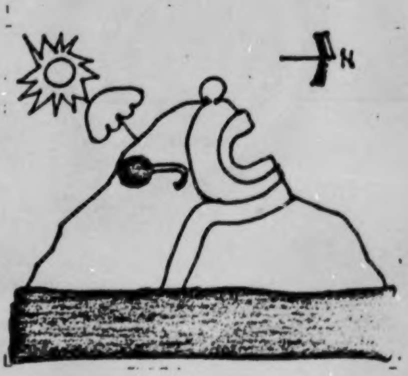
We accept the sun as a part of everyday, as a signal that night is past, as something that adds heated punch to summer and a gently warmed brilliance to winter. It is a resource that can be used on a continuum of scales, from the use of complex solar collection systems to the use of an appropriately textured and coloured surface.

Heat intensity is controlled by a number of conditions both on the ground and in the atmosphere. The effect of atmospheric conditions (such as the degree of cloudiness, the season, the time of day) affect the angle of the sun's rays and the distance they must travel. The temperature of rays travelling a shorter distance and through fewer obstructions are thereby stronger. Thus at noon, when the sun is at its highest point and has a shorter path through the atmosphere, a slope, perpendicular to the direction of the rays will allow for the greatest intensity of energy of the day. In summer, the intensity is greatest on slopes which are flatter, since the angle of the sun moves toward becoming perpendicular to the earth's surface in winter. When the sun is low, the steeper slope is better for warmer temperatures.

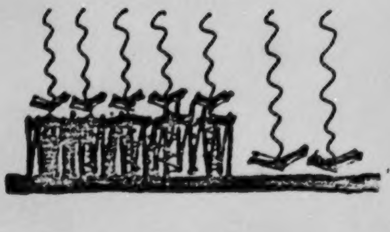
"Snow and ice, especially in combination with sun, are great activity generators, and the beauty of a winter landscape is different but certainly in no way inferio to that of other seasons." p. 69

Boris Culjat, Climate and the Built Environment in the North. (Swede Arkitektursektionens Tryckeri, KTH, 1975).

In addition to the angle of slope, the direction of a slope also plays a role in determining the intensity of radiation. The coldest direction for a slope is one which faces north since the slope is never directly in the path of the sun's rays. The warmest direction changes throughout the year, moving from a southwest slope in January to a southeast slope in the spring and early summer and back to a southwest slope through the summer and autumn.

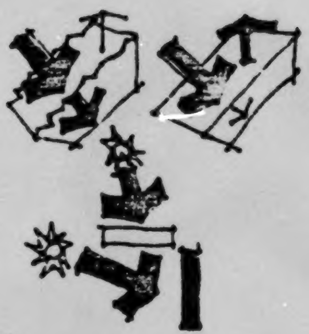


Conditions at the ground surface, such as soil types and cover, control temperatures largely through processes of heat exchange. An area covered with grass will be cooler than an area of bare soil since vegetation lowers the temperature by transferring moisture from the ground into the surrounding air, by trapping cold air which has sunk to the ground, and by shading a part of the soil.



Soil types vary in their capacity to retain heat, and then emit it during cooler periods. With areas of rock having excellent heat storage capabilities decorative mulches such as marble, chips, rocks or bricks are useful for warming the soil. Loose mulches such as grass clippings, leaves, or straw, and decayed vegetation and leaf litter have a low heat conductivity and therefore provide good insulation. One often sees leaves popping out from rapidly heated leaf litter before the leaf buds of trees are conspicuous. A blanket of dead grass and weeds in the autumn becomes a center for frost due to the organic materials low heat conductivity.

The microclimate of an area can also be affected through the use of surfaces with specific colours or textures. Roughly textured, wet, or dark coloured surfaces absorb and retain more solar radiation. Such materials have a lower albedo (the proportion of reflected radiation to insulation) than materials which are smooth, dry, or light coloured. In areas where outdoor surfaces have high reflectivity (a high albedo) and low conductivity, temperature changes tend to be abrupt and extreme (e.g. polished silver does not have the capability of absorbing heat and then releasing it slowly during cooler periods). In areas of materials of low albedo and high conductivity (e.g. wood, red clay brick) heat is absorbed and held in reserve until needed.



Reflectivity may be required at one time, while absorptivity may be called for during another season. Low winter rays can reach deep-set, dark-coloured absorptive surfaces. (When the sun angle is low, vertical surfaces facing the sun receive more solar heat than horizontal ones). High summer rays can be intercepted by horizontal elements of high reflectivity. Since solar radiation from the south is more vertical than that from the east and west, obstructions intercepting radiation from the east and west may have to be lower.

With this information, one can then identify certain objectives in dealing with solar radiation for the design of playgrounds for winter use.

PROVIDE AREAS OF SUN IN WINTER:

- Place activities away from shading devices, against the south and west walls of buildings, and adjacent to hard paved surfaces.

- Make use of existing sun pockets on the site.

- Use deciduous trees for summer shading so that when the leaves are gone the winter sun is admitted.

PROVIDE AREAS OF WARMTH:

- Expose large paved areas to solar radiation.

- Use heat retaining materials such as concrete, masonry, or wood.

- Use darker colours for heat absorption.

- Use canopies of vegetation or architectural structures to reflect outgoing radiation at night back to the area of use.

- Use light-coloured, smooth surfaces to reflect light into areas which might not receive direct sunlight.

PROVIDE AREAS FOR EVENING USE IN LATER SPRING AND AUTUMN:

- Use hard surfaced and absorptive materials to extend the length of evening use.

NOTE: It is important to remember that in summer some of these measures could create undesirable situations. For example, one would want to provide areas of shade, to reduce reflective heating, to use medium colours in areas exposed to the sun. One should then consider zoning, or the use of heat-absorptive materials in tandem with something like grass to relieve the intense heat of summer.

3.6 ICE

"Ice is like that: Now you see it, now you don't . . . on a late afternoon I saw ice crystals suddenly materialize, hesitate for minutes, then sprout forth more daggers . . . by morning the whole pond would be stilled by a thin drumskin of crystals. Breezes were sealed out, the water beneath stood still except where minnows darted, sounds carried from far shores, ricocheting off the glaze. I've since been to Vermont ponds when the new-formed ice so hushed the air that I could hear it strain and break many yards down shore as beavers pushed up from below. They poke their heads out, looking surprised, sniff the air and halt for minutes with their front paws over the transparent lid over their world . . . ice holds on to life right up to its last black inches. One evening a lake lies covered with leaden pieces of a puzzle that the wind pulls apart and fits together. The morning after its adazzle with sun and waves".[1]

Ice is perhaps the most mysterious of the factors. We can all remember those nights of long-awaited hockey games between arch rivals, or those nights of simply skating around and around and around so that sleep brought with it no anxieties, but only the pleasant and powerful dreams of childhood.

Ice is easy to manipulate on a scale as gross as that of providing areas of ice for activities such as skating. On a finer scale there are other things that could be considered such as ice patterns on a sunlit window pane.

Freezing of water is a process of crystallization involving the rigid alignment of molecules. Ice crystals are at first random in orientation, but through the forces of attraction a regular structure is created. This occurs at 0°C. The process is affected by the presence of sunshine, wind, or impurities. Wind will result in the formation of rough ice surfaces. Snow cover serves to insulate and results in reduced ice formation. Also, the rate of freezing of a body of water gradually decreases as the ice layer itself begins to act as an insulating barrier.

"It was the first warm Sunday. Stroller in the park were stopped by the tinkling hiss and gazed through the chain-link fence at the drifting, vanishing shapes. p. 39

John W. Miller, "Knowing Ice", Audubon, January, 1980, Vol. 82/ No. 1.

Clearer ice can be produced by promoting a slow freezing rate with the use of warm water, minimal freezing temperatures, and forms made of poor heat conducting materials. (A slower freezing rate allows more impurities to escape). The direction of freezing is important, and this too can be controlled. If, for example, the top of a form is insulated, this will be the last zone of crystallization and can serve as an escape for the gas being forced from the forming ice.

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[1] *John W. Miller, "Knowing Ice", Audubon Magazine, January, 1980, p. 35-39.*

"It (ice) reappeared just as suddenly i November as needles on puddles. When I woke in the morning it had covered a whole lake - a sudden oil slick - blac foreign, and stiff. By January it had turned lakes into white fields. Men drove cars on it, and after a blowy, rainy night in March it suddenly chang back into choppy waves." p. 35

John W. Miller, "Knowing Ice", Audubon, January, 1980, Vol. 8 No. 1.

In using ice forms for the creation of ice of a specific shape, the contact surface of the form should be smooth and non-porous in order that the ice not adhere to it. Plastics are waterproof, have a smooth surface, and are durable with respect to cracking due to thermal expansion. Wood has good forming strength, but a plastic liner is required to keep it from sticking to the ice.

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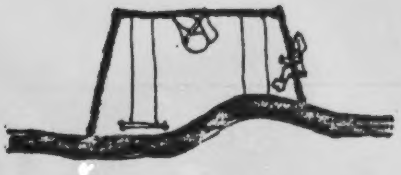
PLAY

PART 4: WHAT IS PLAY AND WHY DO CHILDREN NEED IT?

4.1 PLAY

Prairie winters hold unexploited resources which provide a continuity for summer play experiences, but which at the same time broaden and expand them.

As has been stated, it seems the design of most playgrounds ignores winter. The use made of them in winter is a use made "in spite of". And the best play areas in winter seem to emerge in areas not meant for play - in the snow piled high by snow removal equipment along the sides of roads and walkways; in the drifted snow of huge expanses of fields which can be cut, moulded and shaped.

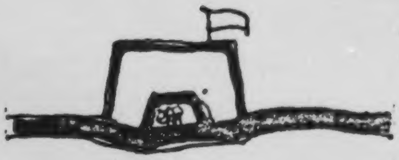


Perhaps this creation of play environments that function during only one part of the year arises from a not complete understanding of play. The motives for and content of play certainly do not vary from summer to winter. It is the physical environment in which play occurs that changes, and it is that environment and its changes that can provide stimulus.

"It (play) cannot be precisely defined. Helanko saw the essential difficulty of isolating play for the purpose of defining it. 'Play is actually like a person in hiding who now and then gives a sign of his presence, only to disappear again in the next instance'". p. 39

Anthea Holme and Peter Massie, Childrens' Play: A Study of Needs and Opportunities, London: Michael Joseph Ltd., 1970

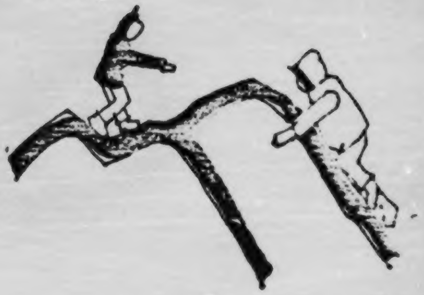
The child's play environment must encourage opportunities and outlets in which a child can manipulate, experience, and become familiar with the social, physical and cognitive aspects of play. These are such an important part of the process of growing up. The winter environment provides all the "loose parts" characteristic of the adventure playground which successfully allows the challenge and stimulation necessary in a good play environment. Instead of the loose parts, such as the sand, dirt, and water of the summer playground, the winter environment has mountains of snow to be piled, carved, climbed, or sculpted.



This cognitive, or creative play in which ideas are tested, and the environment manipulated and transformed, is critical to development of the imagination.

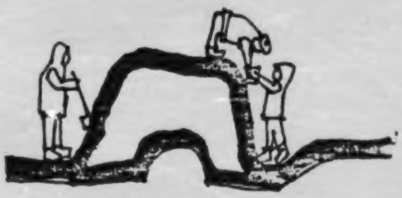
In addition to cognitive play there are three other basic aspects of play that must be provided for - physical play, social play, and quiet play.

Each child has the need for exercise as well as the development of physical skills and muscle co-ordination. It is more important for children to participate than to observe, as they learn more from their own involvement and movements.



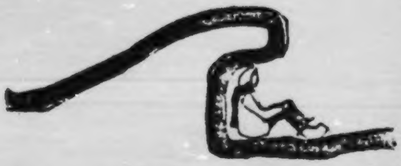
Social play is important, for through it the child learns the use of language and an understanding of human relationships. Social skills are developed together with the ability to work with and learn from others.

Finally, the child should be able to retreat from the main activities to play quietly as an individual or with a special friend. He should be able to just sit and "day-dream".



These aspects must be considered for the design of play environments for all seasons. Although they often occur in areas for which they were not planned, or in ways which were not divined, the play environment should offer the choice and allow the variety.

In the following section outlining a variety of site observations and in Workbook Two, we will see how children respond to their need for these forms of play in the winter environment.



> *"When you are very young you love the winter. A child comes along the street crying and shivering, his wet-mitted hands lifeless at his sides, his neck red from his wet scarf, and his feet soaking wet. But as soon as he gets home and has his mitts placed on the ho radiator, and his socks changed and pan dried, he rushes out again. As soon as he learns to walk he is given a sleigh for Christmas, or a tobaggan and taken to some hill in a park. . . . And if, as he grows older, he hears some teacher refer to the winter as 'the great Canadian challenge', he thinks the man is crazy."*
>
> *Morley Callaghan and John de Visse*
> *Winter, Toronto: McClelland an*
> *Stewart Limited, 1974.*

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RESPONSES

PART 5: THE CHILDS' RESPONSES TO THE PRAIRIE WINTER

5.1 OBSERVATIONS

Children will always be fascinating in their spontaneous playfulness; in their imaginative improvisation. While one has to be careful in inferring too much from informal observations, the process can be one of great learning, and can give an indication of a richness possible in life. It can bring one closer to the real feelings of a child.

"A neighboring boy and I loved to go t a pond in the woods and break the siler with stones. Stones skipped on the gl and chirped like birds. We's skim the over the crystal surface, making ther ride evenly like phonograph needles an sound the pond into the sky." p. 37

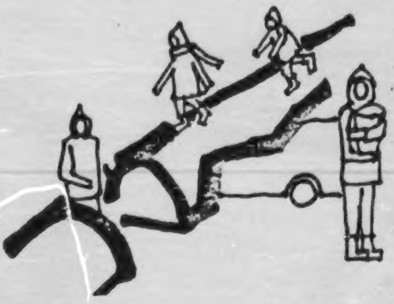
John W. Miller, "Knowing Ice", Audubon, January, 1980, Vol. 82/ No. 1.

Throughout research for this project we conducted observations at two specific housing sites and consulted a number of other studies on the subject of winter play for which observations had also been carried out. These are all detailed in Workbook Two of this report.

The purpose of this section is to summarize those observations as a way of providing an understanding of the existing scenario for winter play.

The most obvious, but most important observation, is that children enjoy winter. Although we often observed in schoolyards that many children seemed to hover around the buildings, we also discovered that by observing children we learned about activities that might never have crossed our minds to invent. Who would have thought of creating an elegant dining situation on a snow mound, of sweeping a path with a branch, of climbing a "Mt. Everest" mound in a snowstorm.

Most spontaneous winter activity, both of the kind that uses up a lot of energy and of the quiet kind, occurred in areas that were in the thick of other activities - pedestrian paths, parking lots, and streets. Although this may have been due to the fact that such areas are usually the sites of the best snow mounds, contact with other such activities seems to attract children.[1] Little use of backyards was observed. This was especially evident in housing developments where the yards are often very small and fenced in, not permitting use of the expansiveness of snow.



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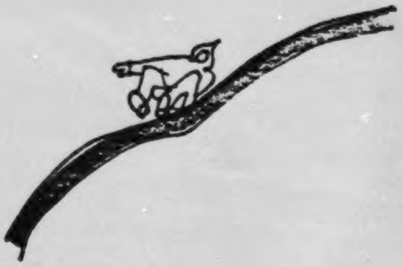
[1] *Clare Cooper Marcus, "Children In Residential Areas: Guidelines for Designers." Landscape Architecture, Vol. 65, No. 5, October 1974.*

Interior courtyards did not see very much use either, even when they held play equipment. Often the play equipment was of the type that had to be removed for the winter, or tied up, or made inaccessible in other ways. When the equipment was used it was usually in new ways, such as a teeter-totter anchored in the snow becoming a springboard.

Winter permitted the use of all kinds of supplementary equipment. Saws were used for cutting snow blocks, jars for scooping snow. When it came to sliding down hills cardboard proved to make a great sled, but more often than not a snowsuit was enough.



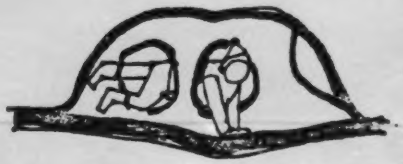
Most areas of observation were not well treed and therefore vegetation did not play a large role in the activities that were observed. Where there were trees, the softer snow of bush areas was taken advantage of and used for such things as headstands.

"The magic circle of play, imagination's own emblem and signet, chalky spiral upon the pavement ground, becomes a sign of affirmation within those tattered and forlorn places." p. 30

Charles J. Zerner, "The Street Hearth of Play." Landscape, Autumn, 1977.

Snow mounds, of course, are the best calling card, especially for winter on the horizontal prairies. Since the location of mounds was usually not planned but the result of some snow cleaning operation, the mounds observed tended to be isolated occurrences and were therefore often a bone of contention between older and younger children. In areas where there were mounds of different sizes the smaller ones were usually peacefully used by the younger children.

There were mounds everywhere - beside parking lots, driveways, streets, and on walks where snow had fallen from the roof. They were used for a variety of activities - sliding, jumping, and rolling. Some became intricately carved caves and forts, or barricades for snowball fights.



As was stated at the beginning of this section, the best thing is that children enjoy winter, and this enjoyment is so evident in the changes that one perceives in the winter play environment. Not only did new mounds form as snow fell and roads were cleaned up, but old mounds acquired new character. New trails emerged on them, and they assumed new shapes through use.

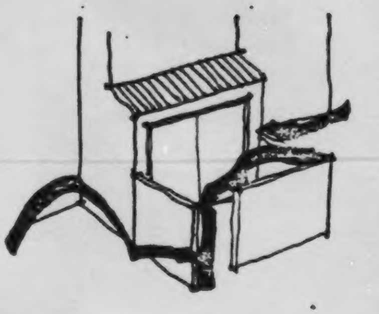
Use produced new creatures.

With the onset of warmer weather the size of groups of children playing together increased. Children suddenly emerged from everywhere to take advantage of expanses of melting snow; to take advantage of the newly appeared paved surfaces for cycling, pulling wagons, and ball throwing.

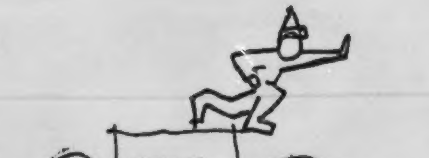
5.2 CONCLUSION

As previously stated these observations provide an initial input of information into the establishment of design guidelines for winter play. What would these observations point out about the differences and similarities of winter and summer play? (Climate is not a solitary controlling factor, but belongs to a complement of influences on play).

The unfortunate thing is that perhaps for the most part children play the way they do in winter of necessity. This is probably true of summer also, but in a more subtle way. For summer definite structures are designed which are meant to complement, or make up for lacks in, the urban play environment. They are usually conceived with particular environmental and climatic conditions in mind. More often than not they bear the stamp of adult ideas about aesthetics and play. (Perhaps because of this winter ends up on top, because a material exists allowing temporary construction and a great deal of manipulation by the children - snow).



Winter play environments should provide potential for the imaginings of children. Malleable elements that children can control and use in the creation of their own activities are extremely important. In this same vein buildings and developments often contain "props" that inadvertently become accessible for play - such as garbage storage enclosures.



Winter allows whole new areas to be used for play, and allows "summer" equipment to be used in a new way. Winter is able to provide play areas with novelty - snow mounds can be moved around, new structures can be built. Winter itself changes - intense cold and warm slush produce varied activities and environments.

5.3 REFERENCES

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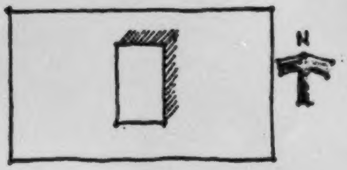
TEST

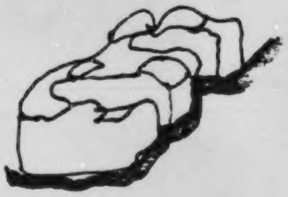
PART 6: PRELIMINARY TEST OF DESIGN GUIDELINES: KRAWCHYK SCHOOL

6.1 CASE STUDY

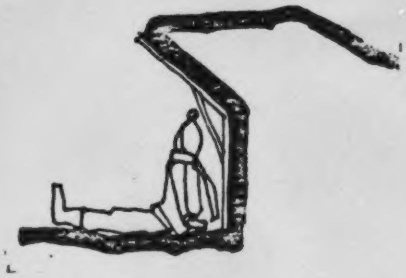
The opportunity for an application of a preliminary set of guidelines presented itself with the Krawchyk School. The school ground had been the subject of a practicum done by a graduate student in the Department of Landscape Architecture at the University of Manitoba[1] and this previous work made it an excellent testing ground. The process and outcome are outlined in greater detail in Workbook Three. We will here attempt to describe some major design components and observations.



The school, an old three storey, brick building, is located in the centre of an east-west oriented site. Since the entrances into the building are on the east, most of the play (especially during recess) occurs in this area. The building provides protection from the wind, but the only warm area is by a brown service door set into the south side of the building. There are a few trees on the west side of the lot, however they do not provide very much protection or shade.



The major components of the tested design were the snow mounds which in this case were arranged in rings. This permitted the creation of warmer sheltered spaces, spaces that provided a sense of enclosure, and a variety of heights for a variety of children. A maple log bridge which was used to close the gap in the ring proved to be the scene of the most exciting playground activity.



Another more direct method of providing shelter was devised by putting a wood structure (painted black) into the south facing side of one of the mounds. This became a good area for intensifying the warmth of the sun and was popular for quiet play and play that involved smaller groups of children.

A butterfly climber built of cable spools as an alternative to the snow mounds was very popular. However, this was part of its downfall. It was easily pushed about on the hard snow, and the top of the platform was very easily iced up.

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[1] *Victor Kallos, Brooklands School Yar A Place to Play, Master's Practicum, Department of Landscape Architecture, U of M 1979.*

The hockey rink in the west yard was also enclosed by a ring of mounds. However, the wind now was not able to blow the ice clear of snow and it became a great game to throw loose chunks of snow from the mounds onto the ice.

A snow maze, ditch ball court (a version of soccer played within a "ditch" of snow) and an ice sculpture (in which a giant clown's head was laid out in plan and built co-operatively by groups of children) were the least successful aspects of the playground. This was due in part to the time of year in which they were constructed (the best freezing weather had already passed) and in the case of the sculpture due to the fact that it was difficult for the children to visualize what it was that they were building.

This whole process was one of co-operative and constant design. That is, one could upon evaluation decide to change an aspect of the design. Or, one saw different uses for various parts of the playgound. For example, the soft snow of the first day of the mounds was used for jumping and for rolling. With the increased compaction of the snow, climbing up and sliding down became the major activities.

GUIDELINES

PART 7: GUIDELINES FOR THE DEVELOPMENT OF WINTER PLAY AREAS

7.1 INTRODUCTION

In the planning and design of housing developments or school and park playgrounds, play should be considered as affecting the entire area. This recognition of the whole area becoming the childs territory produces criteria which can contribute to the richness of the design. Open areas, sheltered nooks, and surfaces to play against are important considerations. In winter, areas acquire a homogeneity of surfacing (through snow) that has excellent "sculpting" potential for children through their play.

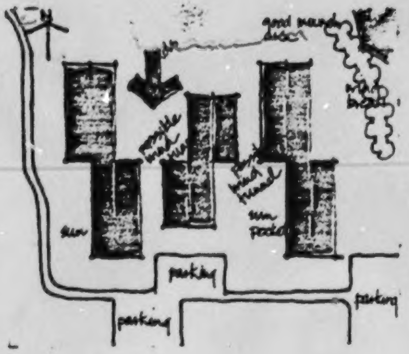
"A cold and dark afternoon, the sun be
behind clouds in the west. The landsca
is barren of objects, the trees being
leafless, and so little light in the
sky for variety. Not a mosquito left.
Not an insect to hum. Crickets gone in
winter quarters. Friends long since
gone there, and you left to walk on
frozen ground, with your hands in your
pockets." p. 38

Henry David Thoreau quoted in Catheri
M. Young, To See our World, GLC Pu
lishers Limited, 1979.

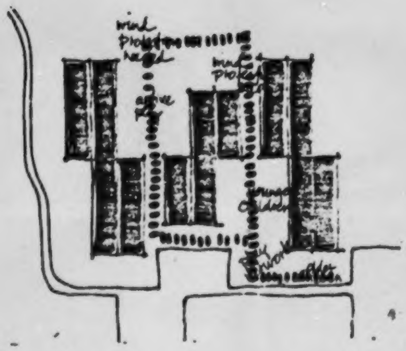
Through our research (the observations, readings, and discussions) a number of fundamental principles in the design and development of a childs' winter play environment became apparent. The following is a summary of those principles.

7.2 GUIDELINES FOR THE SITE PLANNING AND IMPLEMENTATION PROCESS

7.21 Analyse the site in terms of its physical characteristics: the direction of prevailing winter winds, sun exposure, wind breaks and snow drifting patterns, low spots in existing topography and existing surface drainage patterns, existing pedestrian circulation and use patterns, existing play equipment, and any potential obstructions to winter use.



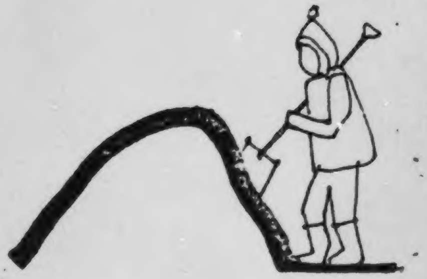
7.22 Identify the program requirements for the users of the intended winter play area. Questions to be asked are: "Who needs what? What are the space requirements of the various activities?"

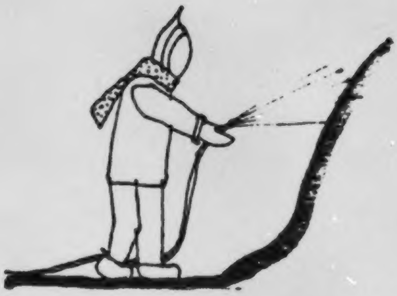


7.23 Organize the site in terms of different zones of activity. Climbing areas for active play, both for younger and older children should be separated; sitting areas for quiet play; loose snow material for creative play. Be conscious of and eliminate potential conflicts between various activities or user groups.

7.24 Children (the user) should be involved in the design, building, and the upkeep of the winter playground. Their ideas should be incorporated into the design of the 'place' and they should be assisted (where feasible) in the implementation of these ideas on the site. With the proper equipment ice sculpting, slide making, tunneling, igloo or quin-zhee making, can be easily done by children.

7.25 Remember that after the first snow and the creation of the first playground components the play area is not complete. Plan for the addition of new components as well as changes to the existing ones. Melting snow, winds and drifting snow, and fresh snowfall, will each modify the play area. The childrens' own actions will have a significant influence on the evolutionary change in the form of the play area.





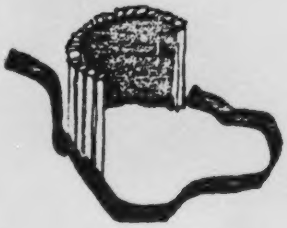
7.3 GUIDELINES FOR THE SITE

7.31 GENERAL CONDITIONS

a) Areas of most concentrated winter play activities should be protected from the prevailing winter winds. This can be accomplished through the use of mounds, plant materials (especially coniferous trees), fences, buildings, or any combination of these elements. This wind break material should be located on the prevailing wind side of the intended play area.

b) Warming shelters or highly sheltered areas should be provided for every outdoor area. If the play area is too cold, paint light surfaces facing into the sun dark colours to make them comfortable to the touch and to warm the area with reflected heat.

c) Provide a convenient water source for flooding areas for skating, creating slides, or making ice sculpture.

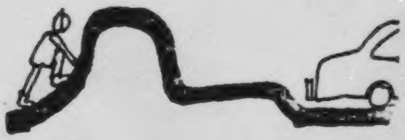


d) Provide for a variety of snow conditions to facilitate the many forms of play. Softer snow can be created by reflected sun, deep snow by wind breaks, and clear, slippery areas blown free of snow by channeling winds. Channel winds also to create interesting snow shapes and changes in the existing land forms.

e) Integrate existing play structures into the winter playground by anticipating wind and snow drifting patterns, as well as reflections from the sun. Use the decks from play structures as shelters.

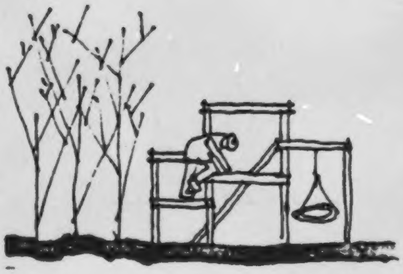
7.32 SITING

a) Parking areas should be designed to safely accommodate childrens play. These areas are regularly cleared in winter and thus their surfaces make ideal hockey or skating and sliding areas. Mounded snow should be pushed far enough from the edges of the parking lot to prevent kids from sliding into the route of traffic or obscure drivers vision. These are the first areas to dry up in the spring or wet weather and their hard surfaces provide excellent bike riding and game court areas.



b) To increase the amount of snow in a specific portion of the play area use wind breaks to catch and cause the drifting of wind carried snow. Fences, mounds, plant material, buildings, or a combination of these should be located on the prevailing wind side of the play area.

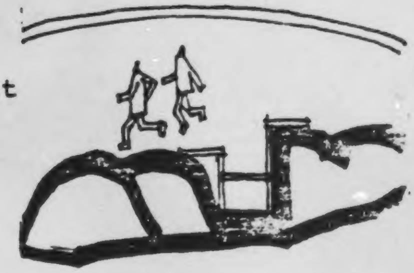
c) To make the play area more comfortable to be in during the winter months place it at the point of the site which receives the most sunlight. In the summer time this is considered undesirable as shade for cooling is necessary. Rather than providing two separate play areas for winter and summer place deciduous trees to the south of the play area. In summer the fully leaved tree will provide the desired shade while in winter the sun will be able to penetrate and warm the play area. Artificial sun screens can be constructed if necessary to provide summer shade.



d) Considering the effects of both sun and wind on the prairies the ideal location for a childrens' play area is at the south or southeast portion of a site. This will understandably vary according to existing site features or site context (such as adjacent buildings to the south of the site that cast shadows).

7.33 SAFETY AND MAINTENANCE

a) Play areas should be close to, but not endangered by nor in conflict with centers of other activities such as pedestrian walkways, parking lots, and unit or building entrances. This will provide greater accessability and safety, as well as the opportunity for casual surveillance



7.4 GUIDELINES FOR SITE ACTIVITIES

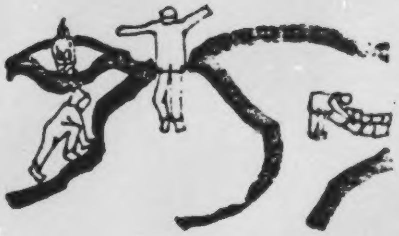
7.41 An effective winter play area should provide for a diversity of activities and environments. Considerations should be made for:

1) active play - sliding, climbing, running, jumping;

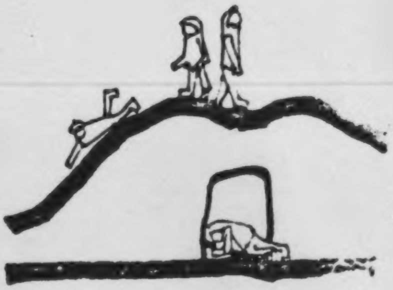
2) creative play - digging, shaping, moulding, exploring, discovering;

3) quiet play - sitting, thinking, observing, "day-dreaming";

4) social play - talking, laughing, sharing, acting.



7.42 Quiet play areas may be formed within areas that are used for active play. Snow mounds can be oriented or hollowed out to enclose a small sheltered area. Areas under play structures can provide protection from more aggressive active play.



7.43 Involve the children in the building of the winter playground. They can be provided with the tools and loose parts that will allow them to modify the area. They can easily carve mounds or cut blocks of snow, shape slides and steps into the sides of hills, burrow and tunnel, and sweep pathways.

"It is too often forgotten, in our brash, practical, modern world, that twilight, shadow and beauty are as important to a growing child as food and air." p. 11

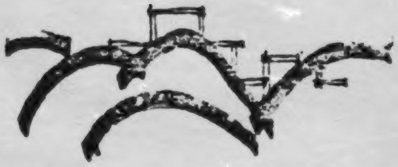
Lady Allen of Hurtwood, Planning for Play, Cambridge, Massachusetts: The MIT Press, 1968.

7.44 Winter play areas should provide for activities that do not require a great deal of equipment. Sliding can be done on pieces of cardboard or on winter clothing.

7.45 Play areas should be designed to allow a sequence of activities. Movement from one object (mound, structure, ice surface) to another should be anticipated and encouraged.

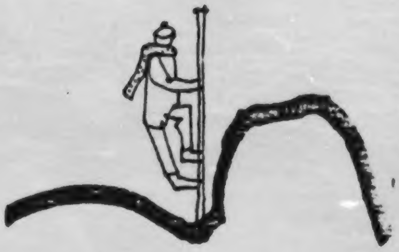
7.5 GUIDELINES FOR PLAY STRUCTURES

7.51 GENERAL CONDITIONS



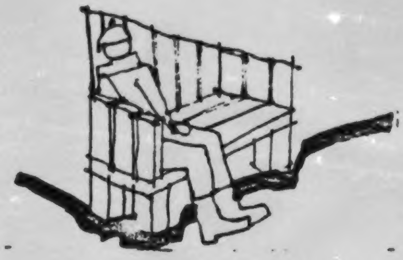
a) Use climbing structures to form the basic components of the playground where snow is difficult to accumulate.

b) Play structures used for climbing in the summer can act as wind protectors or snow collectors during the winter. The structures can be designed to be integrated into the winter playground. A platform can become a bridge between two snow mounds or a structure can form the framework of a cave or shelter.

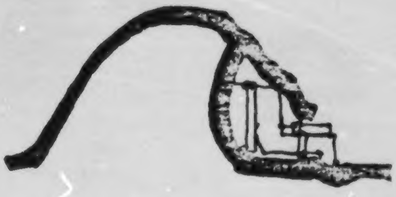


c) Places can be created where one can sit and be warm in the winter through orientation and use of appropriate colours and materials. For example wood absorbs heat and is therefore more comfortable, while objects painted dark colours will be warmer to the touch.

d) Light colours will reflect the sunlight (heat) and cause a softening of the surrounding snow and making it more malleable. This should be done in areas of the playground to facilitate creative play and the construction of snow structures.



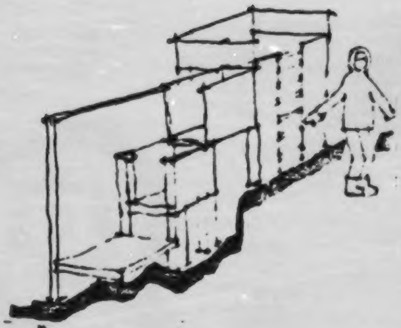
e) Shelters on the winter playground need not always be made out of metal or wood. Snow can be used to make a good warming shelter; the quin-zhee is the simplest example.



The principle of snow toughness must be remembered in the building of this snow structure. It is built by piling a heap of snow, which is left for 2 or 3 hours and then hollowed out. The quin-zhee provides protection from the wind and also insulation against the cold.

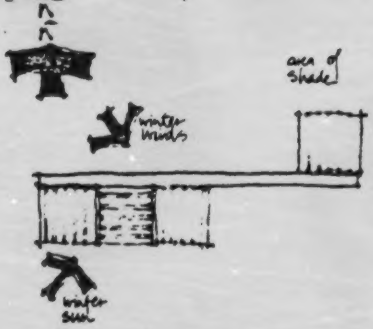
7.52 SITING

a) Play structures themselves can serve to modify the microclimate of the play area. For example, a climbing structure can be designed as a screen to block the wind or funnel the wind away from or into the play area. It can also be situated to trap snow or reflect sunlight.



b) Play structures should be so located that some aspect receives sun during part of the winter day. This will probably necessitate some kind of shading for the summer months.

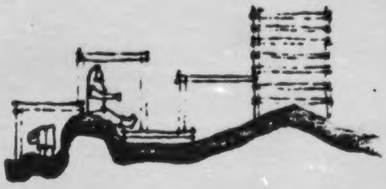
c) Play structures should be oriented to allow penetration by winter sun, protection from winter winds, but channel summer breezes.



7.53 ADAPTING EXISTING STRUCTURES

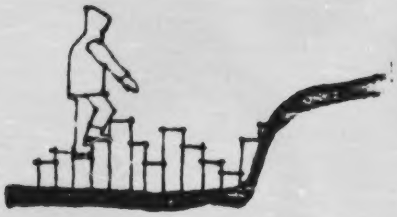
a) Consider the new winter uses that summer equipment may acquire. Previously inaccessible heights will be accessible, while teeter-totters will become spring boards into piles of snow.

b) Permanent play structures should be designed with the winter experience in mind. For example, the accumulation of snow will make the upper levels of existing structures more accessible, while enclosing or making the lower levels inaccessible. Parts of the structure can be used in conjunction with snow to make caves, bridges, or tunnels.



7.54 SAFETY AND MAINTENANCE

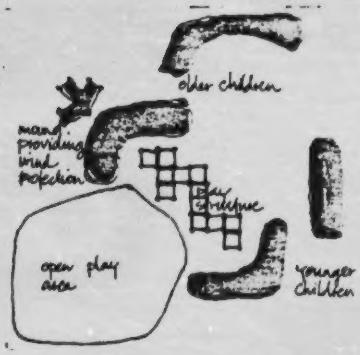
a) Metal parts on play structures should be painted dark colours to reduce the hazard of childrens' skin becoming stuck to it. The dark colours will absorb the heat from the sun and become warmer than the surrounding snow.



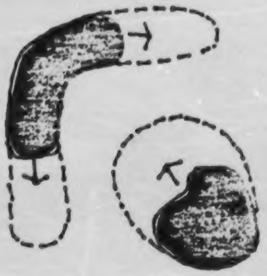
b) Be sure to remove or provide sufficient snow cover over existing low structures so they do not protrude through the snow and cause tripping hazards within the play area.

7.6 GUIDELINES FOR MOUNDS

7.61 GENERAL CONDITIONS



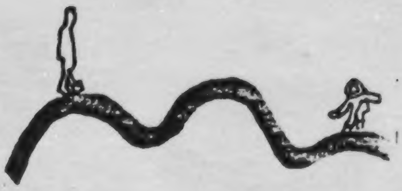
Mounds have shown themselves to be popular and stimulating pieces of play "equipment". These pieces of topography, which are often expensive and difficult to achieve on a permanent basis, can be easily constructed in winter. However, the design of the year round playground should recognize their possible existence during the winter months and their construction should evolve as an integral part of the winter playground. The location of mounds should not be arbitrary or be due to the convenience of crews removing the snow, but should be responsive to existing play and circulation patterns, and should reinforce activity zoning.



7.62 SITING

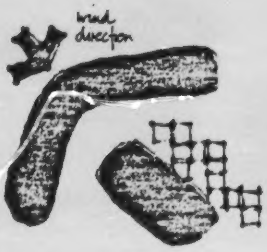
a) Locate initial mounds so they can be added to or modified over the winter season as more snow falls and becomes available.

b) Do not make just one large pile of snow. A small group of larger, or more agressive children will dominate the play. Make a series of interconnected mounds of varying heights to spread the play activity out and to provide the opportunity for a play circuit.



c) Snow mounds can be used for wind protection. Locate them in a position to block the prevailing winter winds.

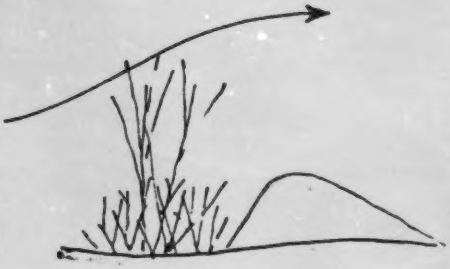
d) Mounds can be used as space forming elements. Rather than a single mound or linear series of mounds develop an interconnected loop. A circuit of play activity will result, as well as the creation of an interior space for play sheltered from the wind.



e) As with the summer playground, use mounds to control pedestrian traffic patterns through the play area. Use mounds to discourage heavy traffic from disrupting play activities.

7.63 RESOURCES

a) Be sure that snow brought in from off-site is free of debris. Snow removed from streets often contains sand, gravel or other sharp objects. This becomes a hazard to children and their clothing during sliding and digging.



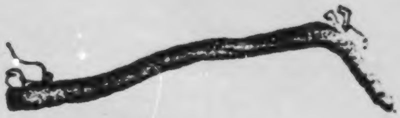
b) Locate wind breaks (trees, fences, buildings, etc.) into the prevailing wind to trap snow and provide a continual source of new play material throughout the winter months.

c) When clearing snow from the site to construct mounds, be sure to leave a cover of snow over the turf area. Exposed turf will burn out in the winter wind and sun, and you will have to reseed or sod the area the following spring.

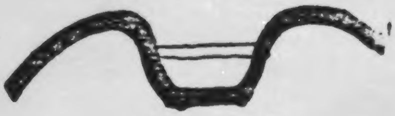
7.64 SAFETY AND MAINTENANCE

a) Snow mounds should not terminate abruptly, or against hard or sharp objects. Nor should their design encourage play movements to be disruptive to other activities.

b) When constructing mounds be sure that summer play equipment is not a hazard to the winter play activity (such as posts sticking out of the snow or swings hanging precariously).



c) Where possible mounds should not be located near parking lots or at the edges of heavily travelled streets. Mounds that occur as a result of the clearing of parking lots should be created in such a way that play is directed away from the parking area. For example, slopes leading into parked cars should be of a degree not encouraging use, while slopes away from parking lots could be made more challenging and exciting.



d) Temporary winter play structures frozen into the snow should be periodically refrozen to prevent accidents and removed from the playground at the beginning of the spring thaw. Warming periods will loosen the object and create a potential hazard.

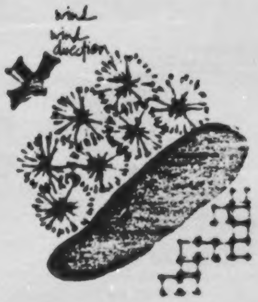
e) Be sure that snow mounds are located in an area that will drain well in the spring. When all that snow melts it has to go somewhere and if drainage is not provided the play area will become a lake or muddy mess. Playing fields will not be available until much later in the season.

ground level

7.7 GUIDELINES FOR PLANT MATERIAL

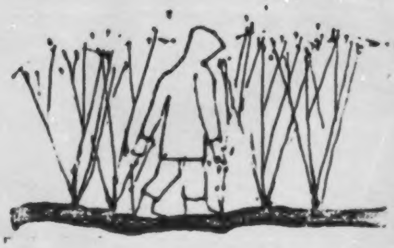
7.71 GENERAL CONDITIONS

Planting for playgrounds requires special considerations in terms of the use of plants as play props, plants in environmental education, and plants as modifiers of the microclimate.



7.72 CLIMATE

a) As with mounds, plants can be used to block out the wind or to guide it into desired areas. Evergreen material makes a more effective windbreak and snow collector than deciduous material. Shrubs and small trees are more effective windbreaks for small children than large canopy trees. They are also more effective at causing snow drifting in childrens' play areas.



b) Planting can be used to mark the boundary of an area, or be used to keep pedestrian traffic out of an area.

c) In preparation for winter conditions use deciduous plant materials on the south edge of play areas and coniferous plant material on the side into the prevailing winds. The deciduous plants will provide the needed shade in the summer and allow the sun "in" in winter.

7.73 ENVIRONMENTAL EDUCATION

a) Planting on playgrounds should include species that are of special interest in winter; and useful in environmental education:

- plants with winter seed pods or fruits;
- plants with interesting bark textures or colour;
- plants with interesting form; or
- plants which attract specific forms of winter wildlife.

NOTE: A more complete list of plants and their special winter characteristics is included in Workbook Four.

b) A special area of maximum wind protection and sun exposure, and with minimal snow cover should be created to allow the flowering of early spring plants.

7.74 SAFETY AND MAINTENANCE

a) Because plants are more brittle in winter and subject to more damage from bending and pulling they should be well protected. This can be accomplished by grouping them in mass, by protecting them with a fence or wall, or by locating them out of the range of heavy activity.

b) With the increased snow depths lower branches of larger trees within the play area are more easily accessible for climbing. Special reinforcements (cables, guys) should be installed to protect the branches of the trees and prevent breakage.

7.8 GUIDELINES FOR PLAYGROUND SURFACES

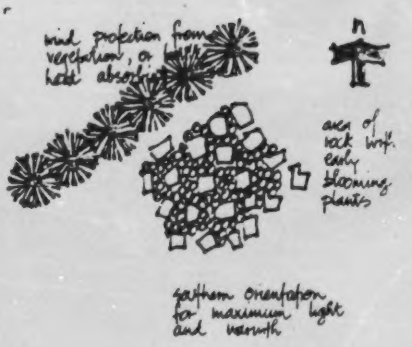
7.81 GENERAL CONDITIONS:

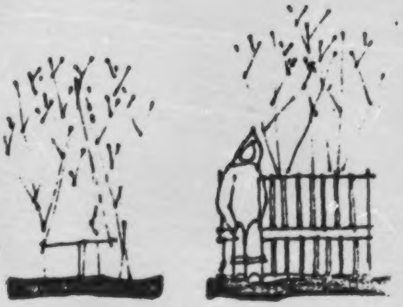
a) The ideal winter playground has a diversity of surfaces: smooth and slippery surfaces for sliding or skating, steep surfaces for sledding, or rough and bumpy surfaces for climbing.

b) Wind breaks should be used to trap wind blown snow to provide fresh surfaces for making trails, playing games (fox and geese, angels in the snow), or just

"Is not this a language to be heard and understood? There is, in the brown and gray earth and rocks, and the withered leaves and bare twigs at this season, a purity more correspondent to the light itself than summer offers." p. 64

Henry David Thoreau quoted in Catherine M. Young, To See our World, GLC Publishers Limited, 1975.


wind protection from vegetation, or heat absorbing
n
area of rock with early blooming plants
southern orientation for maximum light and warmth



"When the ground was partially bare of snow and a few warm days had dried its surface somewhat, it was pleasant to compare the first tender signs of the infant year just peeping forth with the stately beauty of the withered vegetation which had withstood the winter - life everlasting, goldenrods, pinweeds, and graceful wild grasses, more obvious and interesting frequently than in summer even, as if their beauty was not ripe till then, even cotton - grass, cattails, mulleins, johns - wort, hardhack, meadowsweet, and other strong - stemmed plants, those unexhausted granaries which entertain the earliest birds - decent weeds at least, which widowed nature wears." p. 13-14

Thoreau quoted in Lauren Brown, Weeds in Winter, New York: W.W. Norton and Co. Inc. 1976.

carving your name into the clean snow.

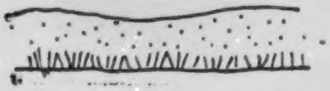
c) Ice areas intended for free skating or younger childrens' play should not be of a size or form to allow the playing of hockey. Such areas should either be made smaller, be made serpentine in form or contain sufficient obstacles to inhibit the playing of more aggressive ice sports.

d) Ice areas for skating will require several 'floods' before an adequate surface is established. It will also require occasional flooding during the season to repair worn surfaces and re-establish a smooth finish. Therefore, an adequate water source should be readily available. Be sure that surrounding berms will accommodate additional flooding.

e) Hard paved areas should be kept relatively clear of snow. This will quicken the melting of sparse snow cover and assure their being dry and usable in the wet spring weather.

7.82 SITING

a) Areas intended to be flooded for ice skating should be located over level, hard paved surfaces with suitable drainage available for runoff during the spring thaw. These areas of hard surface (concrete, asphalt) can be easily cleared of snow and flooded without fear of damage to underlying turf. Grass surfaces under ice areas are generally killed off due to the lack of a sufficient insulating winter cover and the large amounts of standing water in the spring.



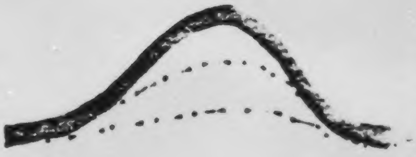
7.83 SAFETY AND MAINTENANCE

a) Slippery surfaces should not be placed near hard vertical surfaces nor areas bounded by sharp objects.

b) Special surfaces created for skating or sliding should be kept away from pedestrian walkways and entry points to buildings.

c) Channel winds through the use of wind breaks to clear off ice surfaces used for skating. Here one must sacrifice (if decided important) comfort during playing time for ease of maintenance.

d) An spring approaches, spread the snow from snow mounds out evenly across the site. This will encourage more even distribution of melt water and reduce the likelyhood of flooding.



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WORKBOOK ONE

8.1 WIND

8.11 TYPES OF WIND FLOW

Wind flow occurs in primarily three ways. In the case of laminar air flow, layers or streams of air flow on top of one another in parallel patterns. Turbulent air flow involves air masses moving in the same direction, but in a random pattern. Separated air flow occurs when layers of air flow on top of one another, with each layer varying in momentum.

8.12 WIND, TEMPERATURE AND COMFORT

Wind increases convective and evaporative cooling. A howling wind does not change the air temperature. What is produced for the body is a continuous heat loss and the sensation of a lower temperature through the removal of a protective film of air and moisture. Under conditions of bright sunshine the cooling is reduced.

8.13 VEGETATION AND WIND

Vegetation acts as an obstruction to wind through the creation of frictional drag. Even differences in the height of grass have been shown to influence wind speed.[1] As the air moved from a longer to a shorter grass cover there was an acceleration of wind speed at a height of 1 metre, with an increase of from 2½ to 4¼ m./sec. over the first 50 metres and an increase of from 4¼ to 4 3/4 m./sec. over the next 50 metres.

Farmstead shelterbelts will provide minimum protection for farm buildings and service areas when three rows of trees are located at least 100 feet from the main building. In an area of heavy snowfall a single row of caragana or willow should be planted 50 to 100 feet outside the main shelterbelt to provide a snow trap.[2]

The optimum density for a shelterbelt is 50 to 60%.

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[1] Keith Smith, Principles of Applied Climatology, London: McGraw-Hill, 1975, p. 42.

[2] Saskatchewan Agricultural Services Co-Ordinating Committee, Guide to Farm Practice in Saskatchewan, 1976. p. 126.

8.14 CHANNELLING WIND

Wind can also be controlled through various methods of channelling. The ventury effect is based on the principle of channelling an air mass through a small opening. A windward oriented channel, be it a street or a tunnel, can accelerate the prevailing winds.

High speeds occur when a small opening on the high pressure side is combined with a large one on the low pressure side.

A smaller surface facing the wind does not cause as much turbulence as a larger surface.

8.15 WIND AND FENCES

A baffle added to a solid fence increases the area of protection. A baffle slanted away from the wind lets the wind flow over gently. In one study the greatest protection two feet away from the fence came with the baffle at an angle of 65°.[3] When the baffle is slanted toward the wind the flow is forced straight up, with the area near the fence receiving the greatest protection.

A louvered fence provides protection over a distance equal to twice the height of the fence. The protection provided is not as effective as that provided by a solid fence, with or without baffles. When the louvres directed the wind down, the protection was even less as the louvres direct the wind into the area to be protected.[4]

8.2 SNOW

8.21 SNOW FORMATION

Snowflakes happen to be formed everywhere throughout the atmosphere, but come together to form snow cover in these areas where the air temperature above the earth is below 0° C for a period of time. The ice crystals formed when water vapour reaches levels with sub-zero temperatures usually melt in falling and new crystals form around their edges. High flying clouds produce minute ice crystals, while the snow falling from low-flying clouds might sometimes be only drops of mist.

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[3] *Sunset Books, How to Build Fences and Gates.*

[4] *Ibid.*

8.22 STRUCTURE AND PROPERTIES OF SNOW COVER

The type of snow and cover is subject to a great many influences. Climatic conditions at the time it falls will have a hand in its nature and shape. Snowflakes are also subject to deformation while they fall. The snow cover itself changes with occurrences of hoarfrost, sleet, and evaporation. It begins also to condense with the force of gravity acting on it, with thawing followed by freezing, with the influence of the wind. The snow cover is also influenced by mineral particles; by dust which finds its way into the cover. The nature of the soil surface beneath the snow is also important in terms of the depth to which it is frozen and the fluctuation of temperature within the cover.

8.23 TERMINOLOGY OF SNOW[1]

English	Kobuk Valley Eskimo (Alaska)
Snow	ANNIU
Snow that collects on trees	QALI
Snow on the ground	API
Depth Hoar	PUKAK
Wind-beaten snow	UPSIK
Smoky or drifting snow	SIQOQ
Smooth snow surface of very fine particles	SALUMA ROAQ
Rough snow surface of large particles	NATATGONAQ
Sun Crust	SIQOQTOAQ
Drift	KIMOAQRUK
Space formed between drift and obstruction causing it	ANYMANYA
Sharply etched wind-eroded snow surface SASTRUGI or SKAVLIER)	KAIOGLAQ
Irregular surface caused by differential erosion of hard and soft layers	TUMARINYIQ
Bowl-shaped depression in snow around base of trees	QAMANIQ

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[1] William O. Pruitt, Jr., "Life in the Snow," *Manitoba Nature*, Winter 1973, p. 5.

8.24 TEMPERATURE AND SNOW

Temperature while snow is falling affects the ultimate state of the snow cover. In colder temperatures the snowflake develops new crystal growths on its sides. Such snowflakes produce a very puffy and light snow cover. Snowflakes in above 0° C temperatures have a simple form because the fine needles have melted away. A snow cover produced in these circumstances is more solid.

8.25 REFLECTIVITY OF SNOW

The intense sparkling of snow is due to a large number of flakes being placed on the same plane and reflecting the light simultaneously. The process of thawing dulls the edges of snowflakes and they lose their ability to sparkle.

8.26 NOISES IN THE SNOW

The cracking of snow is connected with the processes of recrystallization of the snow being affected by a load. The vibrating movements produced by the transposition of particles increase with load application until the frequency is great enough to produce a sound.

8.27 COMPACTION OF THE SNOW COVER

Fresh snow forms a loose layer which eventually becomes more compact under its own weight and the weight of further snowfalls. This compacting (with the air space between flakes becoming smaller and with a subsequent increase in the density of snow) is influenced also by other factors. Snowflakes may shatter or slip into vacant spaces or snowflakes may freeze together at points of contact. These processes occur constantly throughout the winter.

Peak density occurs towards the spring. In the spring thaw the centres of snow crystals are drawn together. The sharp edges and corners undergo external thawing. Compacting is due to the compressing action of the surface tension of tiny particles of water enveloping snow crystals.

Wind also plays a role in compacting the snow cover. It can cause the snowflakes to smash together and break into smaller particles. It can also push them into vacant air spaces. The thermal conductivity of old compacted snow is 3-4 times that of new snow.

8.28 THAWING OF SNOW

Initial steps in the process of thawing involve several sources of heat. In spring the energy radiated by the sun reaches the earth in a more intense form. Air masses bring in heat. Other forms of precipitation also release heat. The process of condensation of water vapour from the air onto the surface of the snow produces heat. The soil is also able to provide the snow with heat. (In an area where the ground has remained unfrozen, thawing and recrystallization occur both from the top of the snow cover and from the bottom.)

8.29 TYPES OF SNOW AND DENSITIES

(adapted from Richter, pp. 15 and 19.)

TYPE OF SNOW	DENSITY
Newly fallen snow	.035 - .16
Loose, fresh, and in clusters	.04 - .07
Loose, newly fallen	.06 - .08
Loose, fresh, medium flakes	.08 - .12
Loose, fresh fine granules	.08 - .16
Loose, fresh, granular	.13
Newly fallen, wet	.13
Fresh snow	.14
Newly fallen with rain	.16 - .27
Wind swept snow	.22

DENSITY OF SNOW	DESCRIPTION
.01 - .10	Very Loose
.10 - .25	Loose
.25 - .35	Medium
.35 - .45	Dense
.45	Very Dense
.32 - .35	Snow is firm enough to support person without skis
.35 - .38	Foot leaves slight print
.40	Human Foot leaves no imprint

8.3 WIND AND SNOW

8.31 SNOW FALLING IN WINDY CONDITIONS

Snowflakes falling in still air at temperatures near 0° C fall on one another and form bigger groups, eventually coming to rest horizontally. In cold weather the snowflakes crumble, break into separate needles and land on the ground in small pieces. They bed down close to each other in downward planes and form compact snowdrifts.

8.32 DRIFTING OF SNOW

Over 90% of drifting snow moves along within a foot of the ground. It moves in three ways. In suspension, particles are taken up into fast moving layers of air. Through saltation, larger particles roll along the ground propelled by the wind until they hit an obstacle and make a hop. With surface creep particles too large to be moved by saltation are knocked forward by the impact of bouncing saltating grains.

8.33 ROLE OF THE WIND IN COMPACTING SNOW

The density of the snow increases with the strength of the wind. Snowflakes are treated in several ways by the wind. They can be broken apart and shifted closer to each other under the pressure of the wind. The wind might also just push the snowflakes against each other. When the snowflakes are broken into smaller pieces, they are able to fill the air spaces within the snow cover.

8.34 SNOW AND WIND-MANIPULATION

(Note: Although some of the examples of manipulations that follow are aimed at preventing snow from accumulating in certain places, it should be noted that it might be desirable in certain design situations to have snow accumulate).

8.35 WINDBREAKS, SNOWFENCES, AND SHELTERBELTS

a) Usually the prevailing winds which cause drifting come from a different direction than the winds which bring the snowstorm responsible for the snow.

b) Solid wooden upright screens are quickly covered up by snow and must be extremely strong to withstand air pressure. A large sloping snowdrift occurs on the windward side. If the fence were placed at an angle of 45° to the wind the trough would be eliminated.

c) Elevated wind-deflecting solid screens do not cause any snowdrifts to form. The ground immediately below them is free of snow. The wind is deflected and directed at a sharp angle into the cut.

d) A windbreak on a ridge increases the protected area. (Building up the centre of a lane slightly higher than its edges helps the wind to scour the road clean).

e) The standard snow fence is four feet high with 1½" laths spaced 1½" to 2" apart. It is about 6" to 8" off the ground. By moving such a collecting fence as the drift accumulates, even higher drifts can be created.

8.36 GROUPING OF ELEMENTS

a) It is recommended for farm buildings that groupings in "L" and "U" shapes be avoided as adjacent buildings will deflect snow towards each other. Farm sheds should be open away from the prevailing winds (and thus should face in a southeasterly, or easterly direction).

b) Swirl chambers are used on farms to move snow farther out from a building (Harrowsmith, p. 72). This usually involves a fence at least 8 feet tall built onto the corners of the shed to be protected. The fence forms a 16' by 16' boxed in area at each corner with one side of each box consisting of a long piece of fence. Snow blowing over a building roof will deflect into these areas; from which it will be thrown out farther away.

8.37 WIND, SNOW AND VEGETATION

a) A row of tall weeds acts as a natural snow trap and produces a drift on its leeward side as would a snow fence. Snow falling in calm weather usually assumes the shape of objects where it accumulates. With a wind a triangular snowdrift is stretched out on the leeward side of trees, shrubs and clusters of grass.

b) Thawing in a treed area is slower than in an open field. This is due to the shade and protection afforded from the wind.

8.4 SOLAR RADIATION

8.41 SOLAR RADIATION

Solar radiation brings with it aspects of heat and aspects of light. The heat felt from a winter sun in a clear sky can be augmented or diminished by the reflecting and absorbing qualities of surfaces. Air temperature is a function of incoming solar radiation. About a third of which is reflected by clouds or scattered back to space by suspended particles. Upon reaching the outer limits of the atmosphere the amount of heat received from the sun depends on the elevation of the sun above the horizon, the amount of cloud, and the purity of the air.

Human comfort outside can be manipulated in a number of ways, as seen in the guidelines, but is also dependent on clothing worn and the degree of activity.

8.42 CLOUDY AND CLEAR DAYS

Solar radiation arrives in a form that is partly direct and partly diffused. Diffusion is minimized on cloudless days since there is less atmosphere in the way of the sun's rays. Clear days bring with them a large daily temperature range, which can be accounted for by a large amount of incoming radiation and a largely unobstructed path for outgoing radiation. Where clouds conserve outgoing heat at night, clear winter days are cooler than cloudy days because the outgoing type of radiation prevails for a long period of time as a result of the long night. Clouds conserve heat at night.

These previously mentioned conditions are controlled by the processes of convection and conduction. Convection is the process through which air heated by the warm earth surface expands, becomes less dense and is replaced by cooler heavier air. Eddy diffusion controls the temperature (still air of a lower temperature is heavier than air of a higher temperature, cold air sinks and flows downhill. Obstructions can force it to collect in puddles).

Conduction (heat flow resulting from molecular movements), when compared with convection, becomes insignificant in the heating of air as air is a poor conductor of heat. Conduction accounts mainly for heat transmission with the earth.

8.43 TEMPERATURE AT THE GROUND SURFACE

Heat exchanged by day depends on solar radiation, while at night the heat radiation from the surface of the earth governs this transaction. During hot periods the ground absorbs heat and reserves it. This heat is then given out to the air at night and other cooler periods. (In high mountain areas, the plant world lives close to the ground taking advantage of all posible heat). The effectiveness of this regulation is increased with the thermal conductivity of the ground. Rock has good heat storage capabilities. Sandy soil heats up tremendously in its uppermost layer, but because of lower heat conductivity (due to air spaces between the sand grains) the heat does not penetrate as deeply as in granite. Peat soils have higher temperatures due to their dark colours. The thermal conductivity of soil also increases with a rise in its moisture content as water conducts heat better than air.

It should be noted that in winter the influence of the ground diminishes. However, its composition and cover can still affect such processes as snow melt.

Vegetation can lower the air temperature by

a) transferring moisture from the ground into the surrounding air;

b) retarding ventilation by trapping cold air which has sunk to the ground; and

c) trapping insolation and shading a part of the soil.

8.44 GRASS AND SOIL

Bare soil will cool more slowly than an area covered with grass since the vegetation aids in a more intense radiation exchange. At night a layer of air trapped within the cover keeps the heat close to the warm soil surface, which is at the same time being heated by the upward conduction to ground level of heat energy stored from the day. (By the same token, snow melts more quickly over shorter grass than longer grass because of a better thermal contact between the soil and the base of the snow).

In a meadow there are about 20-50 square meters of living leaf surface for one square meter of ground[1]. This means that the amount of heat lost due to evaporation increases. Along with this a poorly conducting layer of litter will contribute to a withdrawal of heat from the air just above the ground.

8.45 INSULATION OF THE GROUND

When soil is plowed it is looser, contains more air, and is a poorer conductor of heat. Because of less heat transfer from the lower layers of the ground, the surface is colder at night. Before the onset of colder weather a frost glaze can be observed in such disturbed areas.

8.46 ALBEDO

The term albedo indicates the rate of reflected radiation to the insolation. An albedo of 40% or .4 means that the ground reflects 40% of the radiation and absorbs 60%. Roughly textured, wet, or dark coloured surfaces absorb and retain more solar radiation, and thereby have a lower albedo than surfaces which are smooth, dry, or light-coloured. In areas where outdoor surfaces have a high albedo and low conductivity one experiences extreme or abrupt temperature changes. On the other hand, in areas where materials of low albedo are combined with materials of high conductivity, moderate microclimates occur. Such materials aid the absorption of excess heat which is held in reserve and then released when required.

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[1] *Rudolph Geiger, The Climate Near the Ground, Cambridge, Mass: Harvard University Press, 1965, p. 399.*

8.47 INTENSITY OF RADIATION

a) The amount of radiation received is greater at noon because of a higher sun angle and a consequently shorter path through the atmosphere.

b) Sloped surfaces receive more radiation than flat ones and the intensity of this radiation increases the closer this slope is to forming a perpendicular with the angle of the sun.

c) From January to spring, a southwest slope received most radiation. From spring to June the southeast slope is warmest. Through summer and autumn the cycle moves back to the southwest slope. The southwest - southeast slope is closest to spring.

d) At those times when the sun angle is low, vertical surfaces facing the sun receive more solar heat than horizontal ones. (On sunny days vertical surfaces receive actually more heat in the winter than in the summer).

8.48 MATERIALS

a) The albedo of moist surfaces is less than that of dry ones.

b) Reflectivity and absorptivity may be required at different times. Low winter rays can reach deep set, dark-coloured absorptive surfaces. High summer rays can be intercepted by elements of high reflectivity.

The tables on the following page outline the reflectivity of some typical materials with respect to solar and thermal radiation.

.49 COLOURS

a) Light colours are high reflective, while dark colours have a low reflective value.

The different reflective characteristics of colour have been outlined by C.E.P. Brooks

Reflectivity Of Some Typical Materials With Respect To Solar Thermal Radiation. (Olgyay, p. 295)

SURFACE	% OF REFLECTIVITY SOLAR RADIATION	THERMAL RADIATION
Silver, polished	93	98
Aluminum, polished	85	92
Whitewash	80	--
Copper, polished	75	85
Chromium plate	72	80
White lead paint	71	11
White marble	54	5
Wood, pine	40	5
Asbestos cement (aged one year)	29	5
Red clay brick	23-30	6
Galvanized iron, oxidized	10	72
Black matte	3	5

SURFACE	% REFLECTIVITY
Fresh, dry snow	.80 - .95
Cloud surface	.60 - .90
Older snow cover	.42 - .70
Dry grass	.32
Dry, light sandy soils	.25 - .45
Desert	.24 - .28
Dry clay or grey soils	.20 - .35
Dry sand	.18 - .30
Meadows	.15 - .25
Deciduous forests	.15 - .20
Asphalt	.15
Rock	.12 - .15
Rye and wheat fields	.10 - .25
Bare dry ground	.10 - .25
Moist grey soils	.10 - .20
Coniferous forests	.10 - .15
Wet sand	.09 - .18
Bare wet ground	.08 - .09
Dark soils	.05 - .15

(Climate in Everyday Life) p. 296.

Black	100%
Dark blue, brown, green	85-90%
Grey (cement wash)	75-85%
Khaki red, light brown, pale blue	70-75%
Pale colours (straw, cream)	50-55%
White	40-45%

b) Colours and their role are well illustrated by an experiment described in "The Climate near the Ground", by R. Geiger, pp. 136-137. A light brown quartzite wall facing the southwest was painted partly black and partly white. Tomatoes were planted in front of both parts. At first the tomatoes in front of the black wall grew more quickly - but with less yield. The amount of radiation, along with the predominance of long wave counter radiation resulted in mainly vegetative growth. In front of the white section, the greater amount of short wave radiation stimulated productivity at the expense of growth in height.

8.5 ICE

8.51 ICE FORMATION

As the ice front advances across a pond surface, the water freezes along the temperature gradient. The ice has less strength and a tendency to shear along these vertical planes. This occurs because the melting point of the basal plane is lower than within the actual ice crystal through the accumulation of impurities in these areas. With the formation of ice, impurities are forced out of the new crystalline structure into the remaining liquid. The last part to be frozen contains most of the impurities. The whitish centre of most ice cubes can be explained by this.

8.52 ICE COLOURING

It is difficult to have dye spread evenly through ice because as freezing proceeds the dye (foreign molecules) is forced to the basal planes. This can be alleviated by adding the dye when the water reaches 0° C.

8.6 ICE COLOURING EXPERIMENT

An experiment in the colouring of ice was conducted by Norbert Budiou, James Lai, and Chris Nelson for the Course "Process and Form" in the Department of Landscape Architecture, University of Manitoba, during the Spring 1980. The following is a summary of that experiment.

Inert plastic containers (margarine containers) were used to combine the basic hues of blue, green, red, and yellow present in food dyes, ink, and watercolours in media, of coffee, tea, alcohol, and water. Twenty-one combinations were attempted. The first ten plastic dishes were simple combinations of green, blue, and red pigments (either ink, watercolour, or food dyes), in water and one-quarter teaspoon of gin. The remaining eleven dishes were combinations of various hues, pigment composition, and solvents.

1. Green food dye in water (cold) and 1/4 tsp. of gin.
2. Green water soluble ink in cold water and 1/4 tsp. of gin.
3. Green watercolour in cold water and 1/4 tsp. of gin.
4. Blue food dye in warm water and 1/4 tsp. of gin.
5. Blue watercolour in warm water and 1/4 tsp. of gin.
6. Blue water soluble ink in warm water and 1/4 tsp. of gin.
7. "Roll-On" blue ink in warm water and 1/4 tsp. of gin.
8. Red water soluble ink in warm water and 1/4 tsp. of gin.
9. Red food dye in warm water and 1/4 tsp. of gin.
10. Red watercolour in warm water and 1/4 tsp. of gin.
11. Yellow food dye in alcohol.
12. Coffee and 2 tsp. of sugar in warm water.

13. Tea in warm water.
14. Red ink, red food dye, and red watercolour in warm water and 1/4 tsp. of gin.
15. Ten tsp. of sugar in warm water.
16. Red food dye with 1/4 tsp. alcohol and water.
17. Green food dye with 1/4 tsp. alcohol and water.
18. Red food dye in water.
19. Paper (a process and form assignment) defaced with water and alcohol based felt-tipped pens.
20. Separate layers of colour were frozen successively. Each layer was a solution of a coloured food dye and water.
21. Separate layers of colour were frozen successively. Each of these layers was a solution of a coloured food dye, water and 1/4 tsp. of gin.

The first ten containers proved to be generally uneventful. Although warm and cold water supposedly affects the rate of freezing and thus the uniformity of colour and dispersal of molecules - it seemed to have little effect in this experiment. This could be accounted for in the fact that temperatures were not uniform and that the presence of alcohol had a greater effect upon dispersal of the pigment along basal planes than the temperatures of the water.

The last eleven containers provided more interesting results, however. The alcohol solution of trial eleven remained in a slushy state. With colder temperatures it would have frozen. The coffee and tea solutions of containers twelve and thirteen produced a thick, uniform dispersal of colour combining the three different types of pigments produced a dense, and uniform dispersal of colour as well.

The sugar and water solution, on the other hand, did not freeze, but remained in a slushy state, similar to the alcohol solution of container eleven. The fusion of two different colours in trails sixteen and seventeen, however, produced two distinct and separate colours. Of all the trials, the fusion of these two colour solutions resulted in the best separation and clarity of colours.

In trial eighteen, the absence of alcohol in the solution resulted in long basal molecules of water and a concentration of the food dye within the center of the ice. In the plastic tray used for trial nineteen, the water based ink was dispersed randomly, as opposed to the PANTONE (alcohol based) ink, which remained on the paper.

The most interesting compositions were produced by trials twenty and twenty-one. The successive freezing of those layers with no alcohol in the solution produced a clear, distinct, and striking colour combination. Although not as distinct, the layers produced by the solutions containing alcohol were still of some interest. But, the most feasible, and probably the most interesting way of combining colours in a solution is without the presence of alcohol, because the concentration is greater.

Where separate colours are used, either alcohol or pure water may be used, depending upon which affect is most desired - separation and dispersal of the pigment, or concentration of colour, where the basal planes are accented as almost sculptural elements.

8.7 THE PRAIRIE CLIMATE

The prairie climate is characterized by mild summers and cold winters, controlled by the continental interior location and the mountains to the west. The expansiveness of the prairies results in varying climatic classifications - from subarctic in the north to humid continental in the south and highland in the southwest.

This expansiveness is also one of the factors contributing to a variety of microclimates. These differences can be quite pronounced. For example, a low, marshy area might have a frost free season that is a month shorter than adjoining areas relatively few meters higher.

The prairie climate is also characterized by a high number of hours of sunshine - ranging from 2,000 to 2,300 per year. The maximum usually occurs in July with a possible ten hours per day. A minimum of 2.5 hours per day can occur in December. However, prairie winters are usually very bright.

Winter snowfall can be relatively light in the southwestern plains. There can be an average of 8 1/2 inclues per month from November to February, with about 9 inches in March. Minimal snowfalls of 2 inches might occur in October, April and May.

The average rainiest months are June and August with maximum rains coming as thunderstorms.

North, northwest, south and southeast winds account for the greatest percentage of wind throughout each month. The strongest winds come from the north and northwest.

July and August are the hot months. Humidity is usually not high enough to create discomfort.

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WORKBOOK TWO

WORKBOOK TWO: OBSERVATIONS OF THE CHILD'S RESPONSES TO THE PRAIRIE WINTER

For the purpose of this project, observations were conducted at two housing developments in Winnipeg, as well as a number of general locations throughout the city. Two existing studies of winter play were also reviewed in conjunction with these observations. These included a study done at six elementary schools by Roine Thomsen of the Department of Landscape Architecture, and a study conducted at a housing development by Brian Bailey, also of the Department of Landscape Architecture at the University of Manitoba.

9.1 WINTER PLAY WITHIN TWO HOUSING DEVELOPMENTS

The two housing developments selected for this project exhibited a number of similarities and differences, which will become evident through discussion of the observations. On the pages following, the developments are described as are the patterns of play that were observed. The descriptions will be complemented by maps showing the housing layout, general climatic conditions, and areas of activity.

9.11 PEMBINA AND NEWDALE

The first development observed (at Pembina and Newdale) consisted of 40 two-story, row houses. About half of the units were three-bedrooms. The remainder consisted of 2, 4 and 5 bedroom units. More than half of the total number of households were single parent families. There were approximately 120 children on the site, with about half of them being six years of age or under. Only nine were over the age of 18. About 40 ranged from 6-12 years, and 20 from 12-18 years.

The units were grouped around two interior courts (see plan #1, p.9-27) with the development divided into two by a central road and parking areas. The area was also flanked by parking lots. Each unit had a front yard and a back yard. The front yard was open with a path leading from the main pedestrian walkway off the parking areas to the individual units front door. While the front yards were not defined, the back yards were fenced in areas of about 400 square feet facing onto the central courts.

The back yards were not highly used. This could be due to their small size and the high fences surrounding them. There were two designated play areas - one within each of the central court areas. The westerly one had a set of swings, with monkey bars placed slightly above, on a berm. The easterly one had a set of swings and a basketball hoop. The play areas were not used very much in spite of their being in good positions in terms of protection from the wind and sun penetration. (The layout of the development, as a whole, responded well to climatic factors, but there were not really any areas of appropriate size within fenced-in yards or the total development, that created sheltered or especially sunny nooks important to childrens play.)

There were no "site props" that were used in play. The units provided no surfaces or nooks that could be used. The garbage storage enclosures were not accessible for play, because of their height, location, and the way snow accumulated around them. Use of an enclosure was observed only once - the enclosure was at the southeastern part of the development. Two children sat against it (facing south) on what was an exceptionally warm, mid-winter day, talking.

Except for a major well-used mound in the southeast corner, other mounds throughout the site disappeared and appeared as the winter wore on.

Winter winds from the south were intercepted by a fence along the southern edge of the property. A great deal of snow accumulates on the leeward side (i.e., within the development). However, this area was not used very extensively by the children. I can think of two possible reasons for this.

1. The area to the lee of the fence was sloped in such a way that the sloped bank along the sides of the houses caused the accumulating snow to mound in very gentle slopes - slopes of little interest in play.

2. Also this area was not an area of other activities, e.g., one could not see cars or people arriving or leaving. It was not an area of the development that people use to get to another place. (During observation periods, children who were playing in other areas would often stop to converse with children who were on their way somewhere).

The winter northwest winds affected mainly those yards fronting on Newdale Avenue. A great deal of snow was blown out of this area. There had been evidence of trampling, but much of this was possibly due to the area being used as a circulation path by the children of the development in heading home.

With the onset of warmer weather, play moved out into the parking lot and Newdale Avenue. These paved areas were sufficiently clean of snow to allow the use of bicycles and wagons. Puddles became centres of activity.

9.12 ST. ANNE'S ROAD AND WOODYDELL

The second development (Plan #2 , p.9-28) was an area of 100 two-storey townhouse units arranged back to back. Half of these units were three-bedroom. The remainder were 2-bedroom and 4-bedroom. Three quarters of the households were single parent families. There were about 200 children in the development with more than half being under six years of age. There were only 3 over the age of 18. Approximately 49 children were between the ages of 6-12 years, and 25 between 12-18 years.

The development had one central road running in an east-west direction, with parking spaces off of it. There were also small north and south parking lots. Play in the parking lots or on the roads was not a common occurrence (except in the spring), but the areas adjacent to them were widely used.

Since the units were arranged back to back, each unit had only one yard, which was not fenced in. However, the entrance areas were defined by communal sheds, which projected about 5 feet into the yard. Quite a bit of solitary play occurred around these areas.

Within each block of units, there was a

tunnel like passageway, providing a link from one side to the other midway through the block. None of these passageways appeared to be used. (They were generally places of little light and an inhospitable appearance.)

There was one designated play area within the development, at the east end facing the river. The curved climbing bars, swings and slide were bounded by a fence. The area was only occasionally used through the winter, but increased in popularity with warmer weather.

The development itself was moderately, well-treed, with the greatest numbers occurring at the perimeter of the site. In addition, the site was surrounded on three sides by the extensively treed banks of the Seine River. This adjacent area was inaccessible due to the installation of a fence surrounding the development. One slight opening in the fence did not show much evidence of traffic passing through it.

On its northern border the development was open to a field with trees to the east. A ravine in this area attracted some attention as a good place for tobogganing. The field provided a shortcut for children returning home from school and also provided the stage for a bit of play.

The northwest wind coming over this field perhaps accounted, in part, for the lack of trampling evident in those yards facing the field. Although these yards in particular seemed not to be used, others within the development showed evidence of a fair amount of use.

In this development snow accumulated around the garbage storage enclosures in such a way that children were able to reach the top and use them for crawling along.

9.13 COMPARISON OF DEVELOPMENTS

The activities which children created for themselves in the snow were inexhaustible - carving intricate forts; stuffing cans with snow; bailing snow out of a snow boat; lying in the snow; dusting the snow with a branch; preparing a snow supper complete with plates, and napkins; racing toy trucks through the snow; skimming the snow surface on swings; running patterns around trees; selling popcorn; and rubbing snow into their heads.

Even a blizzard promoted play - in fact, it seemed to add to the imaginative richness. Three children were observed during a blizzard acting out a mountain climbing game of exploration and hardship on a 3 foot high mound. They pretended to be ploughing through the snow, huffing and puffing, taking huge steps, grappling with the mound, and sometimes "dramatically" slipping back.

In both areas, children were observed mainly in the company of other children. On only one occasion was an adult present - a mother at Newdale helped her two sons with toboggans on the mound. On another occasion, two boys asked the observer to help them steady their toboggan at the tip of the mound, and then let it go. With the onset of warmer weather, the size of groups of children playing together increased.

The use of yards varied. At Newdale, very little play occurred in the yard areas of the units. At Woodydell, with only a front yard for each unit, there was markedly more play in those spaces.

The play equipment at Newdale was not seen in use, while that at Woodydell was used a few times. Again, it is possible that the locations had something to do with this. The play equipment at Newdale was situated in the interior courts bounded by the units, while at Woodydell the swings and slides afforded a view of the parking lot and central road.

These observations then point out a number of considerations that will be important in the formulation of design guidelines.

1. The design of the development in terms of the grouping of units and location of parking areas can influence such things as the accumulation of snow and the location of spontaneous play areas. For example, in winter, parking areas will be the site of snow mounds because of road cleaning. In spring, they are usually the first areas to have usable surfaces for bicycling. (In both, safety is an

important consideration.) The objective then would be to provide a variety of areas with the potential for various activities.

2. At another scale, the design of the units themselves could provide for winter activities. For example, in late winter, the snow slipped off the roofs of the units at Woodydell and produced mounds in each yard. The yards of the units should also have special characteristics in terms of being of an adequate size, and providing a sense of enclosure without being oppressive.

3. Children make use of many objects in their play - hydro boxes, transformer boxes, and garbage storage enclosures. The garbage storage enclosures at Woodydell were quite high (as were the ones at Newdale). They were situated, however, so that snow accumulated around them and the tops were at such a level that could be reached by children.

4. Areas should be provided in which children can play by themselves, but provision should be made for play with adults as well.

9.2 WINTER PLAY ON SCHOOL PLAYGROUNDS

The observations conducted by Roine Thomsen were carried out as an observation case study for a course in Educational Psychology at the University of Manitoba. Six elementary schools were chosen for the observations which were done during recess periods. Three of the school yards were unimproved, with no built-in play objects. Three were yards with existing play structures, mounds, and other pieces of equipment.

> *"Play is that medium through which a child does his physical, mental, and emotional growing. It is through his play that he experiences life, and comes to a greater understanding of the world around him."*
>
> *R. Thomsen*

Snow play amounted for a higher average percentage of observed play in the unimproved yards than in those areas with existing equipment. The snow play recorded fell into two categories: manipulation (building, sculpting) and free play (sliding, rolling, jumping, climbing, running, crawling, games such as "fox and geese"). The child's body was an important piece of play equipment. Occasionally pieces of cardboard or plastic were used for sliding. Snow play was usually a long-term activity.

In several of the schools the creation of mounds was left to the convenience of the crew removing snow from parking and other areas. As a result, they were often in locations dangerous for play.

Equipment used in the summer was used in a different way during the winter, mainly because accumulated snow provided access at different levels. Decks showed new views, both from above and below. A teeter-totter stuck in the snow was observed to make a great springboard.

Play on play structures amounted for 23-42% of the observed play at the three schools with such equipment. At another school an earth-mound was the only "piece" of such equipment and amounted for 19% of observed play.

Sports play occurred in all six areas, being the preference of boys of an intermediate age. Girls of this age were usually observed talking, and sitting on the play structures. The question is asked, "Is this what they really want to do? Or is there no other activity available on the playground that they would like to do?"

Such miscellaneous play as running, tag, pushing, talking, and standing accounted for a greater percentage of play in the unimproved areas (2% - 28%) than in the improved areas (2% - 5%).

It was concluded that use of certain areas of the playground was related to the location of snowdrifts, mounds, and play structure parts, as well as climatic siting conditions. Improvements offered greater diversity for imaginative play, and as the author states, play equipment should exist to encourage diversity, not a particular activity.

"The design of play equipment, whether it be structures or snow mounds should be designed to facilitate and encourage play, but never be the only reason for a particular play activity. Children use what is available, the more diverse the structures and its elements, the more diverse the play and alternatives to facilitate it".[1]

9.3 WINTER PLAY AT BAYLOR PARK HOUSING SITE

The purpose of the study carried out at Baylor Park Housing Site by Brian Bailey was to explore the design implications of the winter environment on this particular housing area.

Several useful observations resulted from this study. Preschool- and school-aged children were the most frequent users of the outdoor environment in winter. Adults tended to stay inside, except perhaps when such tasks as fixing cars awaited them. Because trampling grass or gardens is not a problem in winter (and noise also is not a contentious issue, since windows are closed) the children used the whole area for play.

Younger children played immediately outside their home. The author suggests that it would be a good idea to provide them with mounds piled from walkways - especially since older children were very possessive of "their" snow piles. It was also felt that favourable microclimatic conditions seemed to be a factor in children's selection of play areas.

Also, it was again noted that often snow piles were in potentially dangerous locations - abutting a road or a blocked corner of a parking lot.

9.4 WINTER PLAY IN THE CITY

These observations conducted for the Winter Play Design Studio in the Department of Landscape Architecture at the University of Manitoba had as their purpose the development of an understanding of the ways in which children manipulate their winter environment and an understanding of the ways in which existing play environments can respect that manipulation. These observations were informally carried out in a number of areas throughout the city by students in the design studio.

What they importantly pointed out was the fact that children are able to enjoy in winter what adults generally do not. Observation in school areas revealed a number of things.

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[1] Victor Kalloe, *Brooklands School Yar* A Place to Play, Master's Practicum, Department of Landscape Architecture, U of M, 1979.

1. The areas close to the school buildings were popular. It was not possible to determine conclusively why this is so. It could be because it is warmer, or because the building provides play surfaces. It could also be because school grounds do not provide in winter for activities different from those provided for in summer - tag, football, and soccer.

2. Pieces of equipment acquire different uses in winter. A soccer post became popular because the level of snow allowed children to reach the crossbar.

3. A relationship was noted between the number of children playing and the proximity to a place where they could warm up.

4. At a school with a large number of snow hills spread throughout the yards it was found that the older children did not dominate the area. The mounds were interconnecting, but children spread throughout the yard and claimed their own territories.

5. In another school with varied site conditions (i.e., treed areas and open areas) play was as varied as the state of the snow. By the edge of the woods crustier snow made the formation of blocks possible, and snow fort building was an engaging activity. In the bush area with softer snow, some children were trying headstands. However, throughout all this quite a number of children stayed close to the school.

In the neighbourhood observations children were observed playing along streets on mounds created by road cleaning. Games such as street hockey were popular. Objects not originally intended for play were used. A transformer box became a base for jumping into the snow. In neighbourhood areas, such as parks, rinks, and away from the houses, adults often accompanied children.

The role of snow is best summed up in the following statement by two of the participants in the design studio, Tom Llewellin and Rob Marchak: "Play spaces were no longer confined to tranditional play areas. We never observed anyone in the playgrounds. The children played in left over adult areas where they were able to build their own play spaces, by the side of the road, between houses, etc.. Snow transforms whole neighbourhoods into adventure playgrounds."

9.5 DATA SHEETS FOR WINTER PLAY STUDIO OBSERVATIONS

OBSERVER:	INGRID THIESSEN
DATE:	13 January, 1980
LOCATION:	North Kildonan
TEMPERATURE:	0° C. to -16° C.
TIME:	Sunday Afternoon
	Sunny, a few clouds, quite windy

OBSERVATIONS:

- 3 children playing in deep snow beside a snow bank along the street. About 5, 6, and 8 years old.
- Cardboard toboggans were used.
- Deeply involved in their play.
- Edison Street is busy and if they fell on the roadside of the snowpile it could be dangerous. The apartment block has no play facilities.
- Springfield Heights School. There were about 12 kids on the rink with 2 adults. It looked like an organized hockey practice. No one else was on the rinks or the school playfield. This could have been due to wind - it is a very open area.
- Street hockey in a safe secluded street. Three children involved.
- Family of 3 cross-country skiing along a creek.

- North Kildonan Centennial Park. 15-20 kids and adults using the toboggan slide.

- No one was using the ice rink which is exposed to wind.

- 2 children and 4 adults playing with dog-sleds and two husky dogs.

- No one was on the play equipment.

- Street hockey on a driveway off of a busy street. 3 children involved.

- A lot of kids were headed toward the indoor rink using the longest method to get there - through deep snow.

OBSERVER: INGRID THIESSEN

DATE: 16 January, 1980

LOCATION: North Kildonan

TEMPERATURE: -5° C.

TIME: Wednesday Afternoon

Sunny, little wind

OBSERVATIONS:

- Kids coming home from school were playing follow the leader on the snowbanks. They were told to get off by the school patrols.

- 4 other kids were also on the snowbanks and were throwing snowballs. The patrols told them to get off the snowbanks and to stop throwing snowballs.

- A five year old carried a large piece of snow home. It looked like it was very special.

- Springfield Heights School recess, 2:15 p.m.
  - On the snowhills.
  - On the play equipment (metal, standard equipment).
  - Lots of rough and tumble play.
  - Self-initiated street hockey.
  - Jam-pail curling - this continued into the School Physical Education period.
  - The entire yard was used.

OBSERVER: INGRID THIESSEN

DATE: 24 January, 1980

LOCATION: Princess Margaret School

TEMPERATURE: -20° C. to -25° C.

TIME: 10:30 a.m. to 10:45 a.m., morning recess

Little wind, overcast

OBSERVATIONS:

- There were a large number of low snowbank hills which were purposely made to avoid the pushing and shoving that occurs on one large hill. The interconnecting hills worked well and spread the children throughout the yard.

- The grade 5 and 6 children (I was told) usually dominate the playground. They were on a field trip during this recess.

- The climbing equipment, both new and conventional, were used but only by a small group of kids.

- Pushing, shoving, sliding, rough and tumble play most dominant play activity.

- 1 game of Football (about 6 students).

- 1 game of Soccer (about 8 students).

- 1 game of Mitt Hockey (about 6 students).

- A lot of children just stood around and watched other children. They leaned against the building or stood in huddles.

- The baseball backstop was used for climbing and sliding. It was favoured by a particular group of children who dominated it all recess.

- They were told not to go on the curling ice. I think for that reason alone it drew a lot of children. Some acted as policemen reminding the others they should not be on it. The ice was still being prepared or reflooded. Normally, they might have been used during recess.

- A new play structure was designed as a mini-physical fitness course.

OBSERVERS: TOM LLEWELLIN AND ROB MARCHAK

DATE: 12 January, 1980 (Saturday)

LOCATION: Fort Richmond

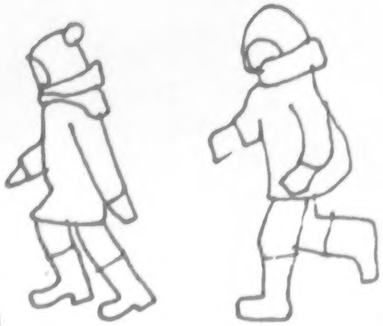
TEMPERATURE: -25° C. to -14° C.
Very cold and windy, grew warmer

TIME: 2:00 p.m. - 3:30 p.m.

OBSERVATIONS:

- Very cold and windy at the start of one observation period, but still more children outside than one might expect. Grew warmer as the observation period progressed.
- Places where we did not find children: Fort Richmond Shopping Centre, school yards, and conventional playgrounds.
- Popular indoor places were: Margaret Grant Pool and Richmond-Kings Community Centre (junior hockey game).
- Skidoo suits seem to be excellent clothing for active play in this weather.

ACTIVITY	NUMBER OF CHILDREN	COMMENTS
Rolling over snow piles	2 boys	Crossing Baylor Ave. with the added adventure of climbing the piles of snow.
Traversing the Ice/Voyaging	2 girls	Baylor Place ponds.
Sliding off snow piles with plastic mats	4 children	Baylor Place. Location sheltered from wind.
Tobogganing	1 small child	Mounds at Acadia Junior High School
Jumping into soft snow/throwing it	1 boy (age about 6 years)	Transformer box of the windswept side of Baylor Place. Soft drifted snow with crust on surface.



9-13

Tunnel building in drifting snow	2 brothers age 6 & 8	In home yard. Several tunnels. Very impressive.
Tunnel digging in roadside piles	2 children	One of several observed around the city. Children playing near the road seem to be sensible about it.

OBSERVER: ROB MARCHAK

DATE: 16 January 1980

LOCATION: Dalhousie Elementary School

TEMPERATURE: -10° C. to -15° C.

TIME: 2:30 p.m. to 3:30 p.m.

OBSERVATIONS:

- Large earth berms surround school entrances.
- Wooded area surrounds school on three sides.
- Recess is broken into 2 - 15 minute periods:
  - Grades 1, 3, & 5 - 2:30 p.m. to 2:45 p.m.
  - Grades 2, 4, & 6 - 2:45 p.m. to 3:00 p.m.

ACTIVITY	NUMBER OF CHILDREN	COMMENTS
Kick Hockey	3 games, 10-15 children each	Children play with their own age/size. Puck and tennis balls used. Lumps of snow for goals.
Football	1 game, 2 boys	Played in a limited space even though open field was available. Their own rules.
Snow fort building	4 children	Edge of woods where chunks of clumped snow made formation of blocks possible.
"King of the Castle"	20 children	Big snow heaps.

Chase-in the bush	4 boys, 10 girls	Swinging round the tree trunks.
Picking rose hips	2 girls	Undisclosed reasons.
Headstands in the snow	4 children	In the bush where the snow is softer.
Ice slide	3-4 children	On the edge of the bush. Only about 4 ft. long. Kept free of snow.
Snowball fights	Varying numbers	One team sheltered by the building. [illegible] team in the open.
Teasing Janitor	2 children	
Strolling	Groups of 3-4, 1 girl alone	
Tunnelling in the snow	3 children	Frustrated by hard packed snow
Girls sitting and talking		Majority of children stayed close to the building. Soccer balls are kept by the school but not in use today.

OBSERVERS: TOM LLEWELLIN AND ROB MARCHAK

DATE: 20 January 1980

LOCATION: Fort Richmond

TEMPERATURE: -10° C. & Wind Chill

TIME: 2:30 p.m. to 4:00 p.m.

OBSERVATIONS:

- A warmer day than the previous Saturday. (see other notes)
- Many more children outside.
- The wind picked up as the afternoon progressed and those children not in sheltered locations were of necessity quite active.
- There were more adults out with their children and generally were actively involved in the play.

- There were larger numbers of people using the outdoor rinks for both hockey and recreational skating.

ACTIVITY	NUMBER OF CHILDREN	COMMENTS
Tabogganing and Mini-skiing	10 children 2 adults	Fort Richmond Collegiate mounds. Younger children mainly stayed with parents. Older children constructed jump and used it for both skiing and tobogganing.
Sliding on snow piles	3 children	Fort Richmond Plaza, piles next to road but sliding away from road.
Tobogganing and X-Country Skiing	21 children 2 adults	Alex Bridge Park. Favorite spot as the run down towards the pond is the longest in the area.
Skating and Hockey	3 children 2 teenagers 2 adults	Baylor Place Lake partically cleared of snow. Teenagers involved with hockey - adults teaching children to skate.
Skating-Playing on Monds	13 children/ skating 3 adults 5 children/ mounds	Ryerson Elementary/Richmond Kings Community Centre. Two hockey rinks used by teenagers and adults. Area cleared in field beside rinks for recreational skating. Mounded snow cleared from ice is well used.
X-Country Skiing	2 children	Kings Park X-Country Trails. Children 13-14 years were on their own.
Street Hockey	8 children	This activity was seen in two different areas with children using street and driveway.
Tunneling in snow piles	11 children	Various locations, those above 6 years old in groups of 3-4, younger children play individually.
Sawing snowblocks	1 child	Child was using a saw to cut "uniform" blocks for a fort.

OBSERVER:	TOM LLEWELLIN
DATE:	21 January 1980
LOCATION:	Dalhousie Elementary School
TEMPERATURE:	-12° C.
TIME:	3:50 p.m. to 4:10 p.m.

OBSERVATIONS:

- Children are dismissed from the school day at approximately 4:00 p.m..
- Signs posted over school entrance states no loitering after school hours.
- Majority of children head directly for home.
- Activities were sporadic and were engaged in as the children moved towards home.
- Generally a brief letting off of steam.
- Activities included:
  - Running, shouting
  - Rough & tumble play
  - Rolling in the snow
  - Snowball fights
  - Sliding on ice runs
  - Climbing on mounds
  - Standing talking in groups

SUMMARY OF LLEWELLIN AND MARCHAK OBSERVATIONS

We based our conclusions on observing children in the Fort Richmond area from January 12-21. The temperature range during this period was from -10° C to -25° C. excluding the wind chill. We observed children actively moulding/forming the snow while others played games not requiring snow. Different types of snow elicited different activities. Soft snow allowed children to bury their head and shoulders as an aid to performing headstands. Hardened or crusted snow was easily carved. Extremely hard packed snow on fields and roads allowed variations of field sports, as well as hockey to occur.

Play spaces were no longer confined to traditional play areas, as we never observed anyone in the designated playgrounds. The children played in left over adult areas where they were able to build their own play spaces by the side of the road between houses, etc.. Snow transforms whole neighbourhoods into adventure playgrounds.

1. Children play throughout a wide range of

temperature variations although their numbers reduce as it becomes colder. Warmly clothed children are active, and shelter is not always important. There is however, a tendency to play in sheltered locations if the wind is strong.

2. Most children play in groups, with three members being the operative number for those over 6 years old. Younger children tended to play individually. When parents were present children played with them.

3. Types of play tended to overlap, but could be divided into three broad categories:

   - Physical Play
     - strenuous activity
     - competitive sports
     - mock battles
     - testing skills

   - Creative Play
     - building forts
     - digging tunnels

   - Social Play
     - sitting, talking
     - activities in groups

OBSERVER: C.H. THOMSEN

DATE: 22 October, 1979

TIME: 10:15 a.m. (morning recess)

TEMPERATURE: Gray, overcast day; ground still wet and muddy.

LOCATION: Bonnycastle School, Chancellor and Chancellor Drive

OBSERVATIONS:

Brand new school with an undeveloped playground, and located at the south end of Winnipeg. Most of the children attending the school have just moved into the neighborhood and into new houses as well.

Initial visit to the school before the snow begins to fall to see how the children are using the site.

Kids are playing in restricted areas:

- Not allowed to play on the muddy field or in the ditch.
- Not allowed to play at the front of the building.
- Must not play on the bike rack.
- Must stay off the low wooden fence around the kindergarten play area.
- Must stay out of the parking lot.
- Must stay on the dry paved surfaces.

The children have obviously developed a set pattern of play to fit the restrictions: They come out the doors and go directly to the play area to begin a game. A few individuals have selected to ignore the restrictions: a few kids playing in the ditch, a few kids playing with loose boards constructing a fort at the far end of the field, a few older kids playing tag around the electric transformer box at the east side of the building, and a constant battle between teach and students to keep the kids off the bike racks. It appears each child serves as a play item and there is much pushing and shoving.

OBSERVER: C.H. THOMSEN

DATE: 1 November 1979

LOCATION: Bonnycastle Elementary School

TIME: 10:15 a.m. (morning recess)

TEMPERATURE: First day of sticking snow

OBSERVATIONS:

Children running all over the place. It is as though someone opened the door and the kids are feeling for the first time a sense of freedom. The mud is gone. The ground is frozen and covered with a layer of snow.

Oh, the surprises the new season brings.

At every doorway the slight incline has been turned into a mini-slide.

Giant snowball making at the west end of the building. The slope at the front of the building is not yet fully developed as a sled run.

Kids running all over the field in small groups, discovering.

One or two kids are rolling in the snow, but it is short lived. Perhaps the snow is not deep enough or there is not enough undisturbed snow.

The kids are still restricted by the teachers.

- No snowball throwing.
- Stay off the grass (?).
- Don't go out too far (!).
- Stay off the slope at the front of the building (north side).

OBSERVER: C.H. THOMSEN

DATE: 2 November 1979

LOCATION: Bonnycastle Elementary School

TIME: 2:30 p.m. (afternoon recess)

TEMPERATURE: It has warmed up and the snow has melted.

OBSERVATIONS:

Children were not allowed out to recess because they were dragging in mud and messing up the school building.

OBSERVER: C.H. THOMSEN

DATE: 7 January 1980

LOCATION: Bonnycastle Elementary School

TEMPERATURE: Refresh snow, sunny, but cold.

TIME: 10:15 a.m. (morning recess)
First day back after the
Christmas Holidays.

OBSERVATIONS:

Poor observation. I was too conspicuous and was the center of attention.

A small mound has been started at the east end of the playground as the result of snow clearing from the paved areas.

Activities noted:

- Wall "painting' with snow. A group of girls were making faces with snow on the side of the school. The contrast of colours was effective. The surface of the school is wood.

- Writing in the snow. This did not last too long as the snow surface was soon disturbed and the children could not find the large clear areas for writing.

- Cutting and stacking snow. A group of girls were cutting blocks of snow out of the drifts of snow next to the building. They then stacked them up to build a low wall.

- Soccer. Even in the snow it is a popular activity. There were a group of boys playing it on the cleared paved areas.

- King of the hill. Right now small mounds at the east end of the playground have taken on extreme importance. They are the center of greatest activity on the playground. Much aggressive play is occurring with children pushing and shoving each other off the slopes.

- Running and jumping. There are those kids who are just running through the snow and blowing off steam. There is a small mound of snow started at the south end of the parking lot. This mound is no more than three feet high and has the attention of a group (6) of younger (1st and 2nd grades) children. They are climbing up on it and jumping off of it. Someone has found a board and has stuck it into the side of the hill making it a good spring board.

SUMMARY OF OBSERVATIONS BY C.H. THOMSEN

As the season progressed and the snow grew deeper the playground changed as well. The larger mound at the east end of the playground grew more extensive; 8' high and approximately 20' in area. It did not form a cone, but was a series of rambling high and low points. With the height increase and larger area more kids could get on it, . . . this congestion became a problem and use was restricted. Officially, class or age group was allowed on it at a time. It was not uncommon to have the younger children come home late for lunch or after school with the excuse; "but, that is the only time I can climb on the hill without the big kids".

OBSERVER: GEORGE RUDKO

DATE: 19 January 1980

LOCATION: Crescent Park, along the Red River in the south section of Winnipeg.

OBSERVATIONS:

The indications were that any kids in the park had come specifically to use the man-made toboggan run. The children were accompanied by adults who joined in the sledding. The run was used continuously throughout the entire observation period.

Two children (under parental supervision) were sliding on a small hill near the river. They were using flexible plastic sheets ('Magic Carpets') which could be pulled up at the front to simulate a toboggan.

Children on the man-made structure often went down without sliding devices, relying upon their nylon snow suits for a frictionless surface.

The only other activity within the park was cross-country skiing. This activity almost exclusively involved adults.

OBSERVER:	NORBERT BADIOU
DATE:	12 February 1980
TEMPERATURE:	-22° C.
LOCATION:	Area around Southwood and Crescent Drive Golf Course.

OBSERVATIONS:

- Tunnels were observed in mounds near roads and in back and front yards. They were never very long.
- Hills were used extensively.
    - Bumpy for playing "King of the hill", tag, or sliding without 'Crazy Carpets' or toboggans.
    - Smooth for sliding.
    - Bumpy hills had more kids playing on them and more activities were going on.
- Backlanes were used for street hockey.
- Flat ground (e.g., golf course, river bank, and school grounds) were used for:
    - Skiing - mainly with parents.
    - Playing tag.
    - Chasing each other, playing soccer.
- Few, if any children, just sat around doing nothing unless they were close to something warm, e.g., school doors, sheltered areas.
- Ice skating and hockey seemed to be the activity most popular with kids.
- Few girls.
- Slide was used by younger children.
- Children were fully aware when adults entered into vision
    - They became self-conscious
    - Quieter

- There were fewer number of children out playing when it was windy and cold.

- No snowmen were built. (Might be an adult persuasion.)

WINTER PLAY OBSERVATIONS

OBSERVER: GORDON BONE

OBSERVARIONS:

I spent time at 4 separate school yards each of which offered different play situations. My observations are related mostly to the variations in play as a result of these different facilities.

1. St. Ignatius (Harrow & Corydon)

   Here there was no play enhancing feature. The school yard was completely flat and most of the snow that had fallen had been trampled hard. Many of the kids were involved in 1 of 2 or 3 mass participation games (e.g., football, soccer, and tag). A small number of younger boys and girls were engaged in small groups in corners or against walls manipulating the snow or talking. Older girls were mostly standing about talking in groups. A significant number of kids were playing on the higher church steps.

2. Grosvenor (Guelph & Grosvenor)

   Other than a play structure the grounds were flat as at St. Ignatius. As one would then expect, the play was therefore similar, except that here the kids were more inclined to utilize the area in proximity to or under the elevated school gym. This left nearly 50% of the school yard unoccupied. The play structure was very popular, but mostly with the younger to middle set, both boys and girls.

3. Harrow (Harrow)

   The facilities here included a play structure and a man-made hill which was by far the most utilized zone on the grounds. One face of the hill had been iced, making it most attractive to all of the youngsters. The play structure received limited attention. In addition, on this playground attached to the school is a community centre building open at nights and on weekends. They maintained 2 hockey rinks and offered indoor activities as well. This proved to be a popular play area during after school hours.

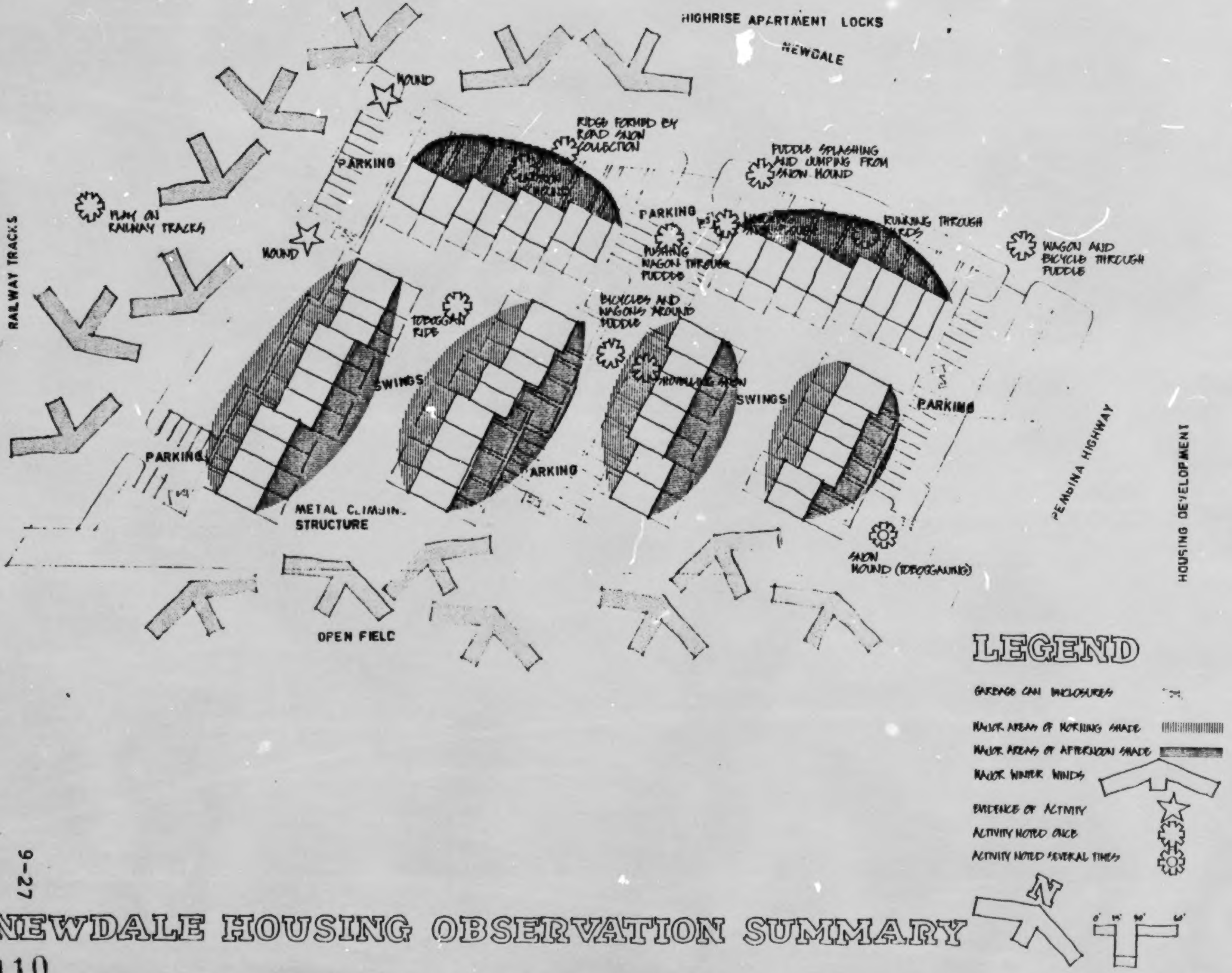
4. Queenston (Kingsway & Queenston)

   Here the schoolyard was equipped with a small ice rink and a small warm-up/change shack. At recess most of the kids and a teacher/supervisor went there directly carrying extra goals and a supply of hockey sticks. Two games began immediately involving both boys and girls. This involved approximately 80% of the kids either directly or indirectly. The soccer goal post was a popular item for climbing because now with snow piled beneath the kids could reach the crossbar and pull themselves up. A significant number of kids remained in another corner of the yard playing on a very small hill while a few spent the entire recess in the shack. The only other activity was a small soccer game involving about 4-7 players on the opposite side of the field.

In conclusion, my observations thus far suggest that kids in general are especially responsive to winter conditions finding enjoyment in what most adults dislike. However, where school playgrounds offer nothing to enhance winter play, then it seems the kids continue to do the same things that they would in the warmer months (i.e., tag, football, soccer, etc.). There is, however, a small percentage that seem to reject winter play and remain huddled in corners, or crowded about doors. My guess is that this behaviour is not due to a dislike of winter conditions, but rather a result of non-enticing play situations to suit those kids' personalities. For example, not all kids enjoy athletics, therefore, hockey, football, soccer, even tag might not interest them. However, provided with the opportunity to be creative, maybe constructing forts or sculpting snow, some of these abstainers might find renewed interest in outdoor play.

My second observation tells me that warm-up shelters are very important. On weekends and after school hours, there exists a distinct relation to the number of kids playing and their proximity to a place where they can warm up. I also believe that these shelters act as important places for meeting and social interaction amongst youngsters.

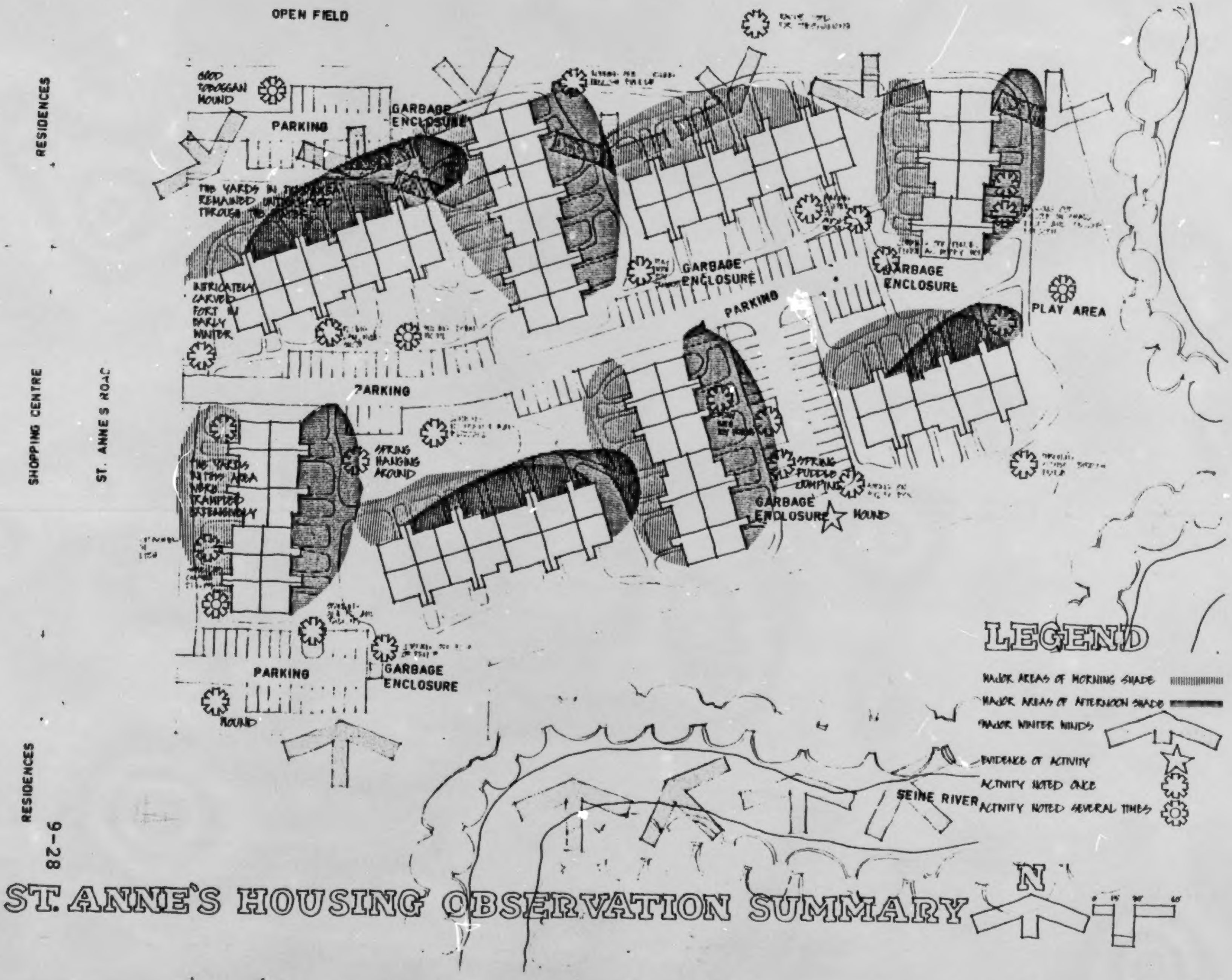
PLAN 1


HIGHRISE APARTMENT LOCKS
NEWDALE
MOUND
RIDGE FORMED BY ROAD SNOW COLLECTION
PUDDLE SPLASHING AND JUMPING FROM SNOW MOUND
PARKING
PARKING
RUNNING THROUGH YARDS
WAGON AND BICYCLE THROUGH PUDDLE
PLAY ON RAILWAY TRACKS
MOUND
PUSHING WAGON THROUGH PUDDLE
RAILWAY TRACKS
TOBOGGAN RIDE
BICYCLES AND WAGONS AROUND PUDDLE
SWINGS
SWINGS
PARKING
PARKING
PARKING
PEMBINA HIGHWAY
HOUSING DEVELOPMENT
METAL CLIMBING STRUCTURE
SNOW MOUND (TOBOGGANING)
OPEN FIELD
LEGEND
GARBAGE CAN ENCLOSURES
MAJOR AREAS OF MORNING SHADE
MAJOR AREAS OF AFTERNOON SHADE
MAJOR WINTER WINDS
EVIDENCE OF ACTIVITY
ACTIVITY NOTED ONCE
ACTIVITY NOTED SEVERAL TIMES
N
0'
30'
60'

9-27

NEWDALE HOUSING OBSERVATION SUMMARY

PLAN 2


OPEN FIELD
RESIDENCES
SHOPPING CENTRE
ST. ANNE'S ROAD
RESIDENCES
GOOD TOBOGGAN MOUND
PARKING
GARBAGE ENCLOSURE
THE YARDS IN THIS AREA REMAINED UNTRODDEN THROUGH THE WINTER
INTRICATELY CARVED FORT IN EARLY WINTER
GARBAGE ENCLOSURE
PARKING
GARBAGE ENCLOSURE
PLAY AREA
PARKING
THE YARDS IN THIS AREA WERE TRAMPLED EXTENSIVELY
SPRING HANGING AROUND
SPRING PUDDLE JUMPING
GARBAGE ENCLOSURE
MOUND
PARKING
GARBAGE ENCLOSURE
MOUND
SEINE RIVER
N
LEGEND
MAJOR AREAS OF MORNING SHADE
MAJOR AREAS OF AFTERNOON SHADE
MAJOR WINTER WINDS
EVIDENCE OF ACTIVITY
ACTIVITY NOTED ONCE
ACTIVITY NOTED SEVERAL TIMES

ST. ANNE'S HOUSING OBSERVATION SUMMARY

Newdale

9-29

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
off site (railway tracks to west)	3 boys about 11 years old	running, jumping off, running back up, plowing through powder snow		group	half an hour	
east toboggan mound (at south point of east parking area)	2 boys, 6 and 4 years old	sliding pretending toboggan was a car	toboggan	group	5 min.	enlisted help of observer in pulling toboggan up the hill and holding it until they got on!
		throwing snow over crest of hill at each other			5 min.	

General conditions

DATE Saturday February 2, 1980

TIME 1:30 - 2:30 p.m.

TEMPERATURE -10° C.

SUN slightly hazy

CLOUD

WIND no wind

GENERAL COMMENTS snow in west front yards not well trampled; backyards sometimes cleared, sometimes not

Newdale

9-30

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
		sliding without toboggan				slope was quite steep and covered with litter
central parking lot	two 12-year old girls	walking along, skipping, slipping and talking.				

General conditions

DATE Saturday, February 2, 1980.

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

Newdale

9-31

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
east toboggan mound (at south point of east parking area)	two four year olds	sliding, running around, up and down hill later sat behind garbage containers for a while, then resumed play.		group		no objects their mother later came out to give them pushes.
mound across by shopping centre		most kids slid down this mound on their way home after the school bus let them off.				

General conditions

DATE February 6, 1980 Wednesday

TIME 4:00 - 4:45 p.m.

TEMPERATURE -7 °C.

SUN none

CLOUD yes

WIND no wind

GENERAL COMMENTS

sticky snow

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
small ridge along Newdale (NW front yards)	two six year olds. girls	sliding			5 min.	
northeast front yard area	same two six year olds joined by another	hiding by fortifitions				
another ridge along Newdale	two 7 year old girls	throwing blocks of snow, rubbing snow into their heads.				

Newdale

9-32

General conditions

DATE February 6, 1980

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

Newdale

9-33

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
west interior court	an 11 yr old girl; two 5 year olds.	the older one pulls the younger ones on the sligh.	Sleigh			hard going in the powder snow — one of the younger ones would get out and push — most fun.
north central parking area	two four year old boys	watching snow plow				
east toboggan mound		move to to mound sliding and leaping off.	red plastic toboggans			

General conditions

DATE Sunday, February 10, 1980

TIME 1:30 -2:00 p.m.

TEMPERATURE -10°C.

SUN hazy, but with glare

CLOUD

WIND light wind

GENERAL COMMENTS
a bit of snow still falling; light snow; fresh
inner court areas not trampled at all.

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
front yard (facing onto central parking area)	6 yr old girl	shovelling front walk	a small shovel	solitary.		

General conditions

Newdale

9-34

DATE Sunday, February 10, 1980

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

Newdale

9-35

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
Central parking lot entrance	two girls one 7 and one 4	the little one is first carried pick-a-back. they then walk hand in hand. the little one begins to play in the puddle, splashing, walking around. Each time a car came by the older girl would pull her away. the two foot high snowbank was of occasional interest. It became more and more slippery as it was compacted. the two would stop to talk to other children from the development who would walk by this area on their way to other places.				

General conditions

DATE Saturday, March 22, 1980

TIME 12:00 - 12:20

TEMPERATURE -5°C.

SUN sunny

CLOUD

WIND no wind

GENERAL COMMENTS snow very granular; snow along south fence still untouched

Newdale

9-36

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
central parking lot	7 children	standing, talking disperse one boy pushes another on a wagon through puddle	assorted bicycles, wagons.			
east corner of Newdale	3 children	play on road - wagon trying to avoid collisions with bicycle	wagon, bicycle			

General conditions

DATE Thursday March 27, 1980

TIME 4:00 - 4:30 p.m.

TEMPERATURE + 5°C.

SUN sunny

CLOUD

WIND no wind

GENERAL COMMENTS

snow melting; snow at northern end of site easy to run through - almost liquid; at southern end difficult to negotiate.

St. Anne's and Woodydell

9-37

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
yard (west facing yard, block 8)	4 yr old	shovelling walk	small shovel	solitary	15 min.	
	joined by another child	chasing				
parking lot. (west central parking lot)	4 yr. old	swinging a can around trying to stuff it with snow.	Javex can	solitary	10 min.	
northerly mound (at edge of north parking)	3 girls about 8 yrs. old	sliding (once)				
west mound	↓ moved	cleared mound of debris; then worked at "bailing" the loose snow, as in a boat. From time to time they would just lay in snow				

General conditions

DATE Sunday, February 3, 1980

TIME 12:00 - 12:45 p.m.

TEMPERATURE -10° C.

SUN slightly hazy

CLOUD

WIND no wind

GENERAL COMMENTS
the yards of the units are generally well used; area around play equipment well trampled!

St. Anne's and Woodydell

9-38

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
parking lot (east central parking lot	1 6yr. old boy	running toy trucks over snow	truck			
hydro box in south-east. parking area	same has moved.	sitting				
play area!	1-3yr. old girl and 2 - five yr. old girls	twisting on ! swings sliding back to twisting	swings, slides, raggedy-ann doll			

General conditions

DATE Thursday, February 7, 1980.

TIME 4:00 - 4:45

TEMPERATURE -15°C.

SUN sunny

CLOUD

WIND no wind

GENERAL COMMENTS
fresh snow

St. Anne's and Woodydell

9-39

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
north facing yards of block 3	1 boy 12 yrs. old.	delivers newspapers, walks along knocking icicles off ridge				
west facing yards of block 3	two girls, one 3 yrs. old, one 5 yrs. old.	one sitting, the other shovelling into drift.				

General conditions

DATE Thursday, February 7, 1980

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

St. Anne's and Woodydell

9-40

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
play area	two five yr. old boys.	swinging				
south facing yard, 'block' 3	3 five yr. old girls	burrowing into the mound to cut a block in order to make supper.				

General conditions

DATE Thursday, February 7, 1980

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

St. Anne's and Woodydell

9-41

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
east facing yards of block 6	two 4-year old boys	playing with trucks	trucks partitions			within shelter of shed partitions
mound on south side of west central parking area	two boys - 1 five years old and 1 three years old; one girl about 4	climbing a mound about 2½ ft. in height; feigning great exhaustion, huffing and puffing. one boy takes to "running down the hill, and "ploughing through the snow taking huge steps; they then start taking flying leaps off the mound; then grappling, as in mountain climbing, up the mound sometimes slipping back.				

General conditions

DATE Saturday, February 9, 1980

TIME 2:15 - 2:35

TEMPERATURE -14°C.

SUN no sun

CLOUD very cloudy

WIND from south 40 - 50 km./hr gusty

GENERAL COMMENTS
snow falling; very icy and granular: near blizzard conditions;
site very bleak and windy

St. Anne's and Woodydell

9-42

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes	General conditions
garbage can enclosure south parking area	one five year old girl	climbing on fence, lying on the edge, jumping off. another burrows in the snow than moves to the fence.					DATE Monday, February 11, 1980 TIME 4:10 - 4:45 p.m. TEMPERATURE -15°C SUN very sunny CLOUD WIND no wind GENERAL COMMENTS fresh snow

St. Anne's and Woodydell

9-43

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
garbage can enclosure (most easterly point of east central parking area	four children	taking turns jumping off into snow bank from tip of enclosure (for about 5 minutes.) then one 5 year old girl works her way across the edge as on a hobby horse. She then tries to balance on one leg on a car heater outlet				
east facing yards of block 4	two four year old girls	dig out a shelter in a small sidewalk drift and sell popcorn				a very shaded area

General conditions

DATE Monday, February 11, 1980

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

St. Anne's and Woodydell

9-44

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes	General conditions
ravine - to north of property	4 children	sometimes their toboggans were left behind and they took to plodding down the hill in the deep snow					DATE Monday, February 11, 1980 TIME TEMPERATURE SUN CLOUD WIND GENERAL COMMENTS
mound by south parking lot	two 4 yr. old girls	tobogganing					

St. Anne's and Woodydell

9-45

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
south part of south east parking area	10 year old boy	hanging over garbage containers, digging things out.		solitary		

General conditions

DATE Monday, February 11, 1980.

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

St. Annes and Woodydell

9-46

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes	General conditions
south facing yards of block 1	4 children	sliding down mound					**DATE** Saturday, March 22, 1980 **TIME** 2:00 - 2:20 **TEMPERATURE** -5°C **SUN** sunny **CLOUD** **WIND** no wind **GENERAL COMMENTS** snow very granular.
hydro box (south facing yards of block 1)	4 children	talking					
south parking	1 girl	sitting in snow digging with cup.					
east facing area of block 8	7 children	grouped around fence, hanging over, talking.					

St. Anne's and Woodydell

9-47

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
north field	two girls	walking through field dragging toboggan on which they were collecting cardboard and other rubbish for building house				
play area	5 children	at swings				
southern part of southeast parking	7 children,	taking turns at jumping a puddle, splashing as hard as they can				

General conditions

DATE Saturday, March 22, 1980

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

St. Anne's and Woodydell

9-48

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
south parking	4 children	standing around tree and talking				
north facing yards of block 7	1 boy	trudging through snow.				
west facing yard of block 8	3 children	splashing in ditch				

General conditions

DATE Tuesday, April 1, 1980

TIME 4:10 - 4:30 p.m.

TEMPERATURE +5°C.

SUN sunny

CLOUD

WIND moderately windy (cool)

GENERAL COMMENTS

St. Anne's and Woodydell

9-49

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
north yard of block 3	2 girls	running through puddle				
walk north of block 3	boy on bicycle	driving back and forth through puddle				
walk by play area	3 children	shooting by on bicycles				

General conditions

DATE Tuesday, April 1, 1980

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

St. Anne's and Woodydell

9-50

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes
play area	3 children	swinging, running; one digs mud with shovel; picks mud out of boots; one crawling on snow				
east central parking lot	10 children	various activities				

General conditions

DATE Tuesday, April 1, 1980

TIME

TEMPERATURE

SUN

CLOUD

WIND

GENERAL COMMENTS

St. Anne's and Woodydell

9-51

Area of play	Children (numbers, sex, ages)	Type of activities	Objects played with	Solitary or group play	Time spent	Comments and quotes	General conditions
south of southeast parking lot.	5 children	trying to throw stones through fence.	bicycles stones				DATE Tuesday, April 1, 1980 TIME TEMPERATURE SUN CLOUD WIND GENERAL COMMENTS

9.7 REFERENCES

Bailey, Brian. Baylor Park Study Design Implications. Department of Landscape Architecture, The University of Manitoba, 1977, unpublished report.

Marcus, Clare Cooper, "Children in Residential Areas: Guidelines for Designers." Landscape Architecture, October, 1974, pp. 372-376.

Pollowy, Anne-Marie. The Urban Nest. Stroudsberg, Pennsylvania: Dowden, Hutchinson and Ross, Inc., 1977.

Thomsen, Roine. Winter Play Observation Case Study. Department of Landscape Architecture, University of Manitoba, April, 1979, unpublished report.

Winter Play Studio. Field Survey Notes. Department of Landscape Architecture, University of Manitoba, Spring, 1980.

WORKBOOK THREE

138

10.1 KRAWCHYK SCHOOL SITE

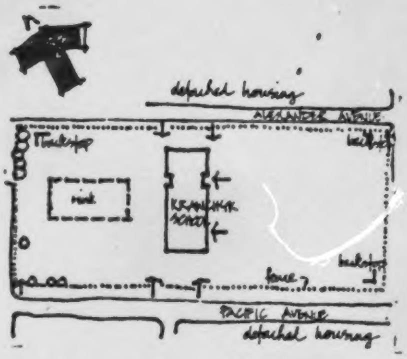
Once the observations of children at play were completed a preliminary set of winter play guidelines was developed. Before finalizing any guidelines for this study we wished to test some of our ideas in a real situation. A site was selected on which we could construct a winter playground and observe further the activities of children in response to our preliminary ideas.

Krawchyk Elementary School, at the north end of Winnipeg, was selected for this exercise. Much data had been already gathered for this site, a working relationship with the residents committee and students established, and a real need identified. In addition, this site had been used earlier as a study area by a graduate student in our program[1] and a master plan for a permanent year-round playground approved. In fact, construction for the permanent facility is to begin during the late summer and fall, 1980.

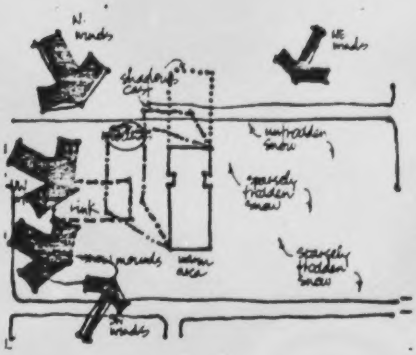
The grades at Krawchyk School include kindergarten through grade five, as well as a pre-school day care program.

The rectilinear school site was oriented east-west with an old three story, brick building centered at the midway point. The entire site was surrounded by a six foot high chain link fence with entrances onto the site directly north and south of the school building, as well as at the far northeast corner of the yard. To the south of the site is Butterworth School (grades 5 to 9) and single family detached housing; to the east a public library, wading pool, and tennis courts; and on the north and west sides are single family detached housing. Immediately adjacent to the north and south edges of the site are relatively busy streets.

Entrances (two) into the building are from the school yard along the east side. Thus, the kids are generally kept in the east playground at recess. The first three

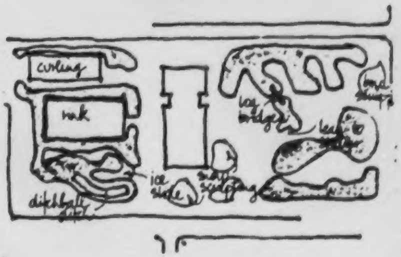


meters height on the building is buff coloured tyndalstone material. Above this level is red brick. Although the building does provide wind protection, the light coloured base radiates little sun reflected heat for warmth on cold days. A recessed service door painted brown on the south side of the building provides a cozy warming space. Generally, it is not uncommon to see kids clustered about the recessed entry doors on the east side of the building in an attempt to get in out of the wind. The few trees on the west yard provide little or no protection.



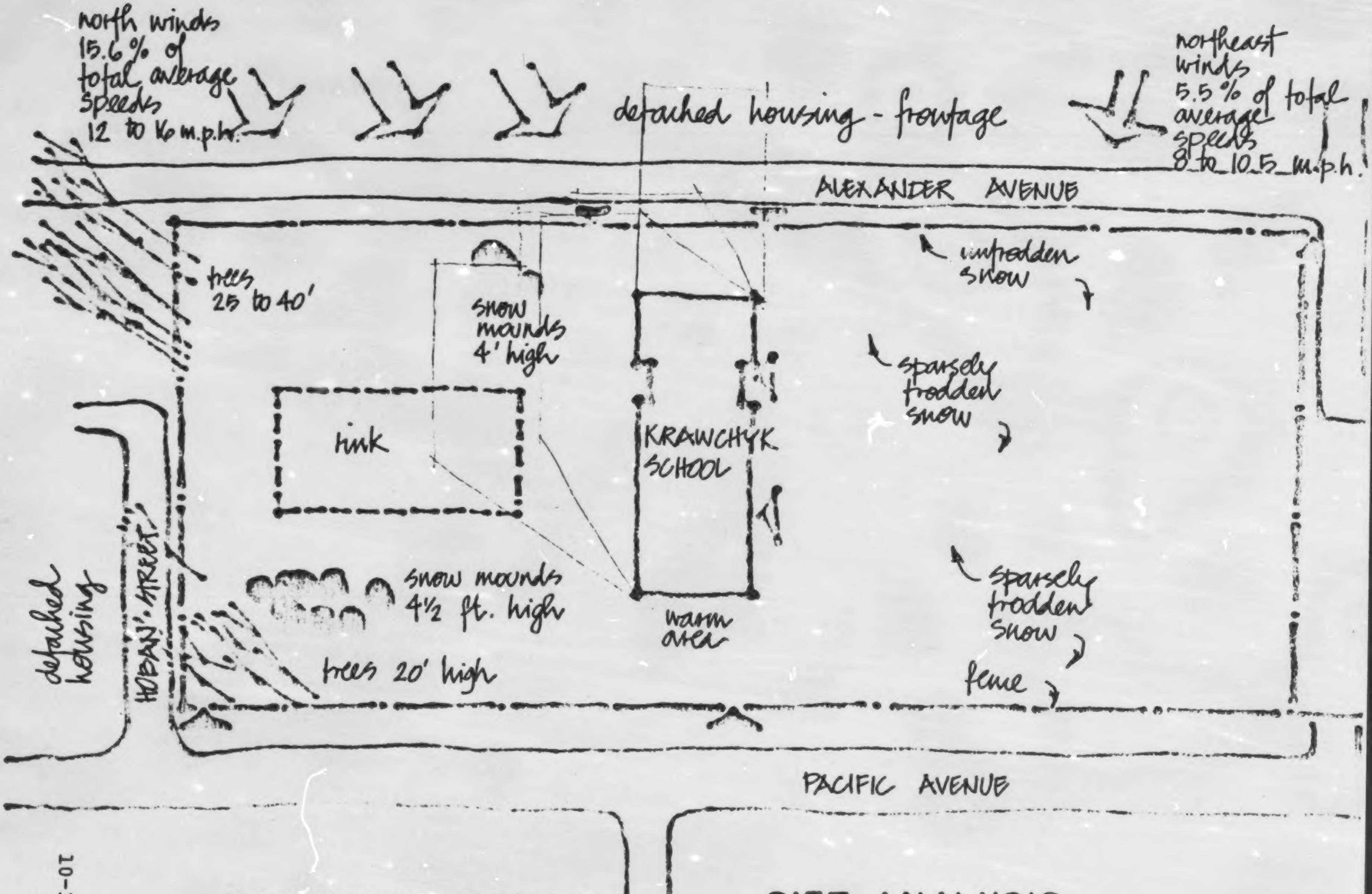
Not a single piece of permanent play equipment exists on the site so any plan for the development of a winter playground would be a vast improvement over the existing sterile conditions. A series of small mounds (1.5 m) had been developed out of existing snow on the playground prior to our involvement and was located in the west yard. Due to its location, it was rarely used by the kids at recess. Also, in the west yard there was a large flooded hockey rink that the City Parks and Recreation Department established for after school hours. Again, this saw minimal use.

A number of alternative design schemes for a winter playground were developed and presented to the staff at the school to get their comments. The idea was to design and construct a 'laboratory' of winter playground ideas that could be tested and modified on a typical site. A summary plan that took into consideration such factors as availability of materials, cost, user needs, educational value, safety and maintenance, and feasibility was developed from the initial schemes. We received approval from school authorities and residents committee to proceed, then set about locating the resources necessary to implement the components of the design.



10.2 RESOURCES

The City of Winnipeg Parks and Recreation Department donated the snow removal equipment and operator needed to construct the snow mounds, as well as the hoses required to flood the field for a hockey rink and in


north winds
15.6% of
total average
speeds
12 to 16 m.p.h.
detached housing - frontage
northeast
winds
5.5% of total
average
speeds
8 to 10.5 m.p.h.
ALEXANDER AVENUE
unfrodden
snow
trees
25 to 40'
snow
mounds
4' high
sparsely
trodden
snow
rink
KRAWCHYK
SCHOOL
detached
housing
HOBAN STREET
snow mounds
4½ ft. high
warm
area
sparsely
trodden
snow
trees 20' high
fence
PACIFIC AVENUE

KRAWCHYK SCHOOL SITE ANALYSIS

10-3

making the ice sculpture. Cable spools were donated by a local cable and wire company and fabricated to form a "butterfly" climber. The two large Manitoba Maple logs given by the City of Winnipeg Forestry Department were used to make bridges connecting the mounds of snow. Miscellaneous shovels, ice choppers, buckets, . . . were made available through both the School Division and the Parks and Recreation Department. The wood and hardware necessary for the construction of the small A-frame warming shelter were purchased through funds made available through this research project which was funded by Canada Mortgage and Housing Corporation. The only other materials used was all the snow on the site. No additional snow was brought onto the site.

10.3 COMPONENTS

As was mentioned earlier, the intent was to develop a catalogue of winter playground parts. We concentrated the greatest amount of activity on the east side of the school in response to existing user patterns.

10.31 MOUNDS

For two days the snow removal equipment was used to remove all the snow from the playground and pile it into a series of mounds. The mounds were intended to not only provide a challenging climbing apparatus, but serve to moderate the microclimate by blocking the wind. The height of the mounds was limited by the type of equipment used to move the snow. In our situation, the front-end loader used was only able to stack the snow to a height of three meters. By building ramps or using a track vehicle this height can be increased. After one day of use by the children the snow had been compacted approximately one half meter. (Be sure to allow for settlement when planning winter play facilities made of loose snow.)

We spread the mounds out to disperse the kids to avoid congestion and conflicts, and varied the heights to add more interest. The mounds were developed in rings to provide an activity circuit and to create a protected interior play space. Kids could slide into the circle, the wind would be blocked (In Winnipeg, the winter winds are variable, some come out of the south), warmer slopes would be provided, balls could be kicked and easily retrieved, and the children easily monitored by the playground staff.

10.32 SNOW MAZE

To the north of the large mounds in the east yard we constructed a series of individual smaller mounds. As it was becoming too late in the season for proper freezing of ice we were unable to flood the area between the smaller mounds. The mounds were intended to be islands (obstacles) forming a maze within an ice skating area.

10.33 DITCH BALL

In the west yard we constructed a "ditch ball" court. This was a ring of mounds about 1.5 meters in height within which a modified version of soccer could be played. The ball could be kicked about without having to go any great distances to retrieve it. The goals were located at either end of the hot dog shaped court. The kids gave it their own name of "crater ball".

10.34 HOCKEY RINK

As was mentioned earlier the Parks and Recreation Department had already developed an ice hockey rink in the west yard. Once a week they would come to the site and flood the ice to give it a new surface. The one modification we made to this rink was to construct a ring of mounds around the rink for better wind protection and to provide a barrier for the puck.

10.35 ICE SCULPTURE

We assisted one of the classrooms in creating a clowns head which could be climbed on and seen from the school classroom. The class was split up into groups with each responsible for constructing a separate part of the clowns head. One group did an ear, one the nose, one group an eye, etc.. The hardened snow was difficult for the younger kids to work with and once constructed a few of the older kids not involved in the exercise damaged the sculpture.

Another problem with the construction was the childrens' difficulty in visualizing the face of a clown. In plan form the kids could climb on each separate part (a nose, an ear, etc.), but not really see the face in total. This could be done from the classroom window above. A more detailed account can be found in section 10.5.

10.36 A-FRAME

In order to provide some degree of warmth and protection from the wind on the playground, we constructed an A-frame shelter. A notch was carved into the south side of one of the mounds and the wooden shelter placed into it. Snow was then packed around it to weight it down and hold it in place. The interior of the structure was painted black and the structure had an open side facing south to trap sunlight and maximize its heating potential. The initial idea was to make a number of these shelters and spread them around the site. The interiors of each could be painted a different colour to illustrate different ranges in reflectivity, as well as provide varying degrees of warmth. Only one was actually constructed during this experiment. During the summer months the same structure could be used as a climbing device in an obstacle course or merely left as a shelter on the playground. In this case, it should be anchored to the ground to prohibit movement. A detailed drawing of this structure can be found in section 10.7 of this Workbook.

10.37 THE BRIDGE

To provide a connection between two of the largest mounds a large log (15" diameter, Manitoba Maple) was used to create a bridge. Each end of the log was supported by compacted snow and iced in to prevent movement. As an indication of the size, it took six men to put it in position. When the snow began to melt, in late winter, and it became unstable, it had to be removed to avoid any possible accidents.

10.38 BUTTER-FLY CLIMBER

To add diversity and provide an alternative to the snow mounds, we constructed a Butterfly climber out of cable spools. The structure was not very large and not intended to handle large numbers of children. A detailed drawing of this structure can be found in section 10.7 of this Workbook.

10.4 OBSERVATIONS

During a two week period following the installation and development of the winter playground, we made observations of the childrens' play activities and noted the play patterns and modifications made to the snow structures by the kids.

All sorts of constructive things were done with the snow mounds. While steps and slides were carved into the slopes, the kids spread themselves out eliminating the possible conflicts from too much congestion at any one point. During the first day with the uncompacted snow, the favorite game was jumping and rolling down the slopes into the soft snow. As the snow became compacted the activity changed with a major emphasis on climbing up and sliding down.

By far the most popular item on the playground was the bridge. There was a continual fear on the part of the teaching staff that a child would be pushed off and hurt, but in the short while the winter playground existed this never happened. The small amount of snow cover on the log did present a problem, as it was quickly compacted and became slippery. The bark remaining on the log provided a rough enough surface to allow some traction.

The butter-fly, cable spool climber presented problems of a similar sort. It was not a very large structure, but it was very popular. The result, as one might imagine, was that it soon became overrun by kids resulting in much pushing and shoving. It had not been anchored to the ground properly and although it was sufficiently heavy and could not be tipped over, the compacted snow provided an ideal slide on which to push it about. It was interesting to watch the teamwork develop which was required to move the heavy structure. The top platform was a sheet of plywood and the slightest amount of compacted snow or ice made it an instant 'skating' rink. Better drainage from this surface should have been provided. This could be done by either drilling holes or making the deck out of wood slats.

Most of the snow features at the edges of the playground received little or no use. Activities tended to be focused within and around the ring mound at the center of the playground. Small groups of one or two children would occasionally play on the small mounds of snow in the snow maze, but without the ice surface this feature was of little use. Likewise, the features in the west yard (ditch ball, hockey rink with mounds) were rarely used. The snow mounds surrounding the hockey rink prevented the wind from blowing loose snow off this ice and the ice surface was soon covered by a layer of snow. The kids also discovered a new game of throwing the large chunks of loose snow out on the ice to see how far they would slide. The result of all this was an increased maintenance problem and additional headaches for the maintenance crew.

The major ring of mounds at the center of the east field proved quite effective. The childrens' play activities were able to form a circuit of movement; climb up the slope and along the top, across the bridge, slide down the inside slope and climb up the other side, etc.. The interior "bowl" provided wind protection and proved significantly warmer than the surrounding playground; this is where most of the children played. With this mound structure they were able to carve and shape the slopes to suit their own needs. A couple of the children formed very challenging and exciting curving slides down one of the slopes. Hours were spent in modifying and perfecting the "run". This built-in flexibility is rarely available or provided in the traditional summer playground.

The A-frame warming structure also proved successful. We located the structure at the edge of the major activity area to avoid overuse and overcrowding. On one Saturday morning on the playground, with not a child in sight, laughter could be heard. Upon closer investigation two children were found seated in the A-frame enjoying themselves out of the wind and drying their mittens in the warmth of the sun. Clearly, they had discovered the usefulness of the structure.

One sure sign of a school playgrounds success is the amount of use it gets. At Krawchyk, after school was over the playground took on the appearance of a normal recess hour. Kids remained on the playground to play rather than go home.

10.5 NOTES ON THE SNOW SCULPTING EVENT . . .

6 March 1980, Butterworth/Krawchyk Schools

The day was sunny and warm. This is not the time of the year to do this; it's getting too warm and it is not certain how long the snow sculpture will last.

Involved were 20 elementary school children (Ms. Gaulds' class), 10 junior high students (art class), and 7 students from the Department of Landscape Architecture, University of Manitoba.

The objectives were to involve the kids in a winter activity on the playground and assist them in making a giant snow sculpture. This would make the playground more interesting to be on.

Procedure . . . We met with the elementary school children in their classroom to explain to them what was going to happen out on the playground. We had each child tell us what he/she wanted to make and compiled a list of each: canoe, airplane, king in chair, godzilla, hockey player, etc.. A vote was taken to determine what to make. The clowns face was the object decided upon (second was a dragon). We then had the kids dress up for the cold and put a name tag on each one so we could keep track of them and be able to call them by name.

Outside we split the group up; 4 to 5 elementary kids, 1 to 2 junior high kids (as helpers), and one University of Manitoba student as task leader. Each group worked on a separate part of the face. Snow had been piled up about a week earlier and was quite hard and worn.

The tools used were shovels, ice choppers, saws, hose, bucket, red powdered paint, and water.

Two groups of children worked on the eyes, one group the nose, two groups the ears, and one group the mouth. The clown was to be built in plan form so that the kids could actually climb all over it.

We started actual work about 2:00 p.m.. Carving took about an hour, and at 3:10 p.m. we took the kids over the ditch and taught them how to play 'ditch ball'; they call it 'crater ball'. While this was going on, we mixed a bucket of red paint (there was a problem dissolving it in water). The hose was stretched out and we began spraying the forms with water. The kids then came over to help by taking turns spraying (we stayed in control to avoid any disaster). Each child took a small container and poured the red paint from the large bucket all over the nose. The entire form was then sprayed with water. The kids ran off with the equipment and started building their own objects elsewhere on the playground. Clean-up time was about 3:45 p.m.

10.6 TEACHING STAFF QUESTIONNAIRE

In order to aid our assessment of the ideas incorporated in the winter playground at Krawchyk School, we circulated a questionnaire to all the teaching staff at the school. (see the accompanying questionnaire)

Some of the suggestions made for the playground's improvement were:

a) build a larger playground with greater diversity - a variety of activities are needed so kids do not concentrate in one area and get rough;

b) build the mounds further from the school so there will be less mess when it melts;

c) kids like to slide - hose down one of the hills for a slide;

d) kids and staff should be "instructed" on how to use the playground properly; and

e) delete the cable spools - they created lots of problems with fighting (king of the mountain type of games) and were too easily moved.

Despite the problems the experience was a positive one. Generally, there was less fighting during recess and the playground provided the children with "something to do rather than standing around shivering". It "provided greater individual challenge and participation in activities that stimulated initiative". It gave them an opportunity to "fantasize". For a change the children actually enjoyed playing outside.

DEPARTMENT OF LANDSCAPE ARCHITECTURE
FACULTY OF ARCHITECTURE
UNIVERSITY OF MANITOBA

WINTER PLAYGROUND QUESTIONNAIRE - KRAWCHYK ELEMENTARY SCHOOL

To further our research into winter play we would appreciate your comments regarding the winter playground that was constructed at Krawchyk School.

1. Were there any noticable behaviour changes in your students after the winter playground was constructed? Please comment:

   a) greater classroom attention ____________________

   b) less classroom attention ____________________

   c) Greater disciplinary problems in the classroom ________
   ____

   d) less disciplinary problems in the classroom ________
   ____

   e) greater disciplinary problems on the playground ________
   ____

   f) less disciplinary problems on the playground ________
   ____

   g) other ____________________

2. How do you feel the project could be improved for next year?

   ____

3. Were there any specific problems or items that should be added or deleted? Please be specific.

   ____

   ____

4. Generally, do you feel the experience was a positive one? In what way?

5. Would you care to make any further comments regarding the design of the total playground or any of its components?

Thanks for your comments! 10-12

KEN GIGLIOTTI WINNIPEG FREE PRESS

Children at Butterworth-Krawchyk Elementary School are getting more out of the long, harsh winter with, believe it or not, more snow.

Playground fashioned out of snow

By Brian Cole

A once-barren Winnipeg schoolyard has been transformed into a popular winter playground in a unique experiment which called for nothing more than the addition of — believe it or not — more snow.

The idea behind the project was to help children at Butterworth-Krawchyk Elementary School get more out of the long, harsh winter, said Charlie Thomsen, a University of Manitoba professor and co-organizer of the experiment.

After research it was decided to build miniature snow mountains on the flat schoolyard and let the kids have some fun.

That's exactly what they're having.

"I like it because of the slides and stairs," Sheila Menard, an energetic nine-year-old Grade 3 student, said above the din.

"The hills are lots of fun," Derek Picklyk, another nine-year-old Grade 3 student added. "Now I can climb, run and jump."

Before the hills were built the only game he played was soccer. Other youngsters used to spend their time huddled around the school doors. "It's more fun to play now," says nine-year-old Michelle Rochon.

Thomsen said the researchers remodelled the schoolyard "to make the winter environment a more positive experience, so winter is not seen as an undesirable time of the year."

Already the results are good. Even after school, "We find kids out there and not rushing home to watch cartoons on TV."

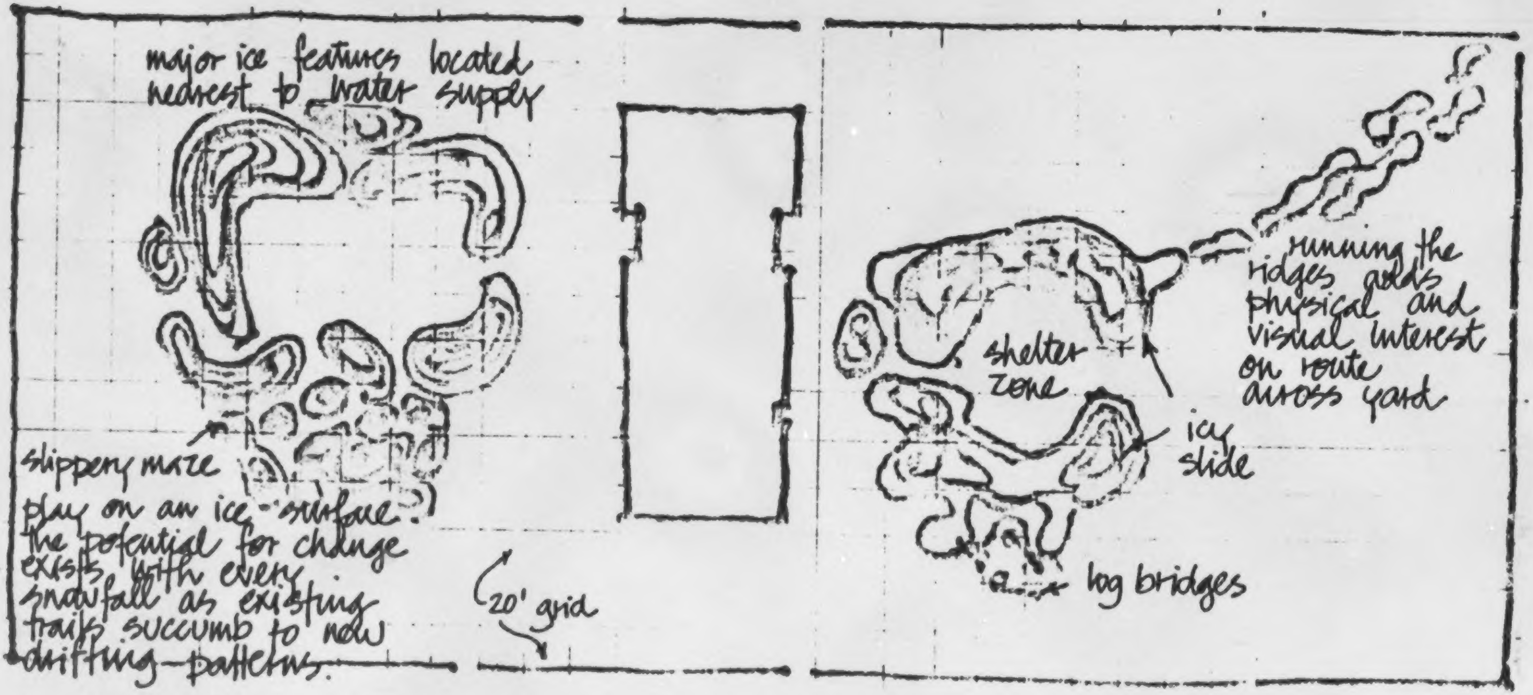
Children aren't the only happy ones. Grade 2 teacher Judy Zurawzuk, 29, says the children are better in the classroom now because the hills have given them more of a chance to "play hard and vent their feelings."

The project is financed by a $2,000 grant from the Central Mortgage and Housing Corporation and is under the supervision of the federal government's Neighborhood Improvement Project. The Brooklyn Residential Advisory Committee is also behind the project.

Besides making slides and carvings in the mountain of snow, the youngsters have developed a ball game played within the snow walls of a crater.

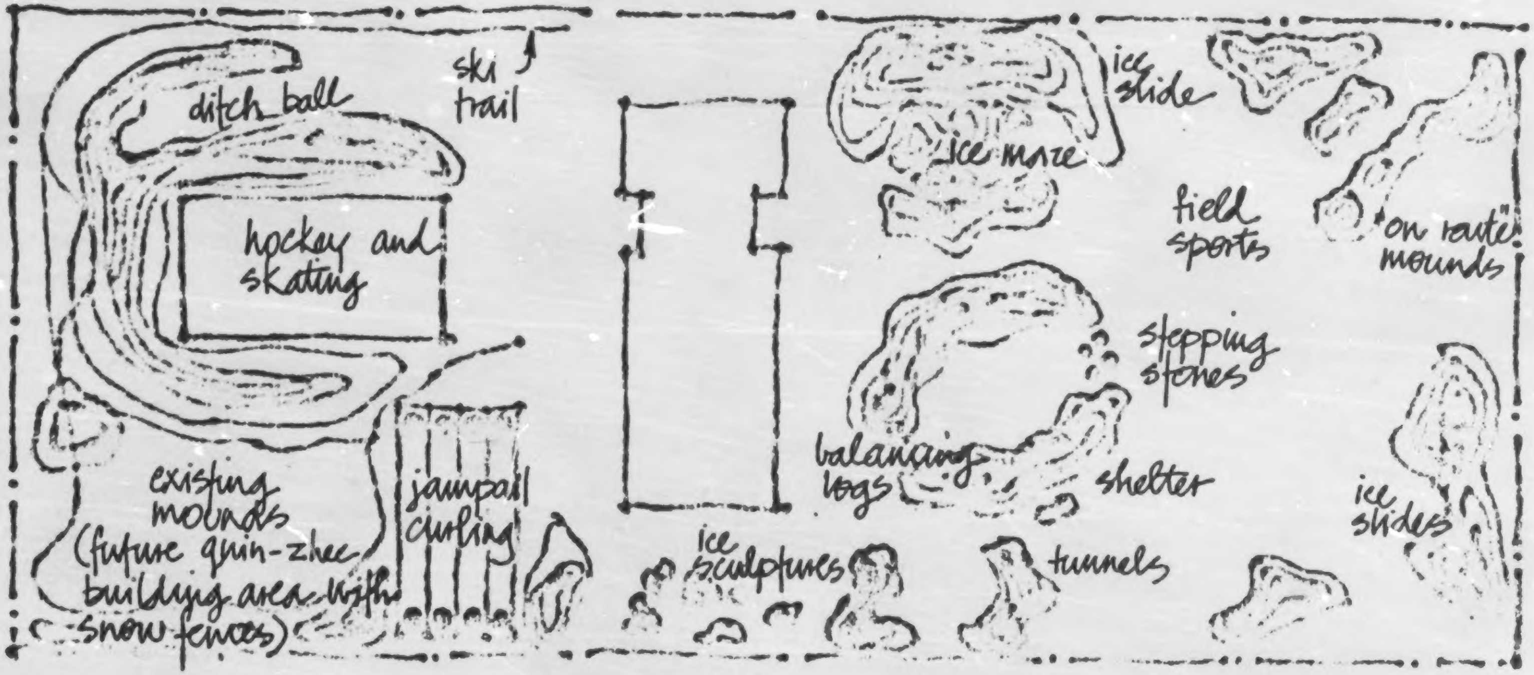
"You'll find they are starting to create games . . . . They're doing all sorts of things," Thomsen said.

FREE PRESS, MARCH 17, 1980


major ice features located
nearest to water supply
slippery maze
play on an ice-surface: the potential for change exists with every snowfall as existing trails succumb to new drifting-patterns.
20' grid
shelter zone
running the ridges adds physical and visual interest on route across yard
icy slide
log bridges

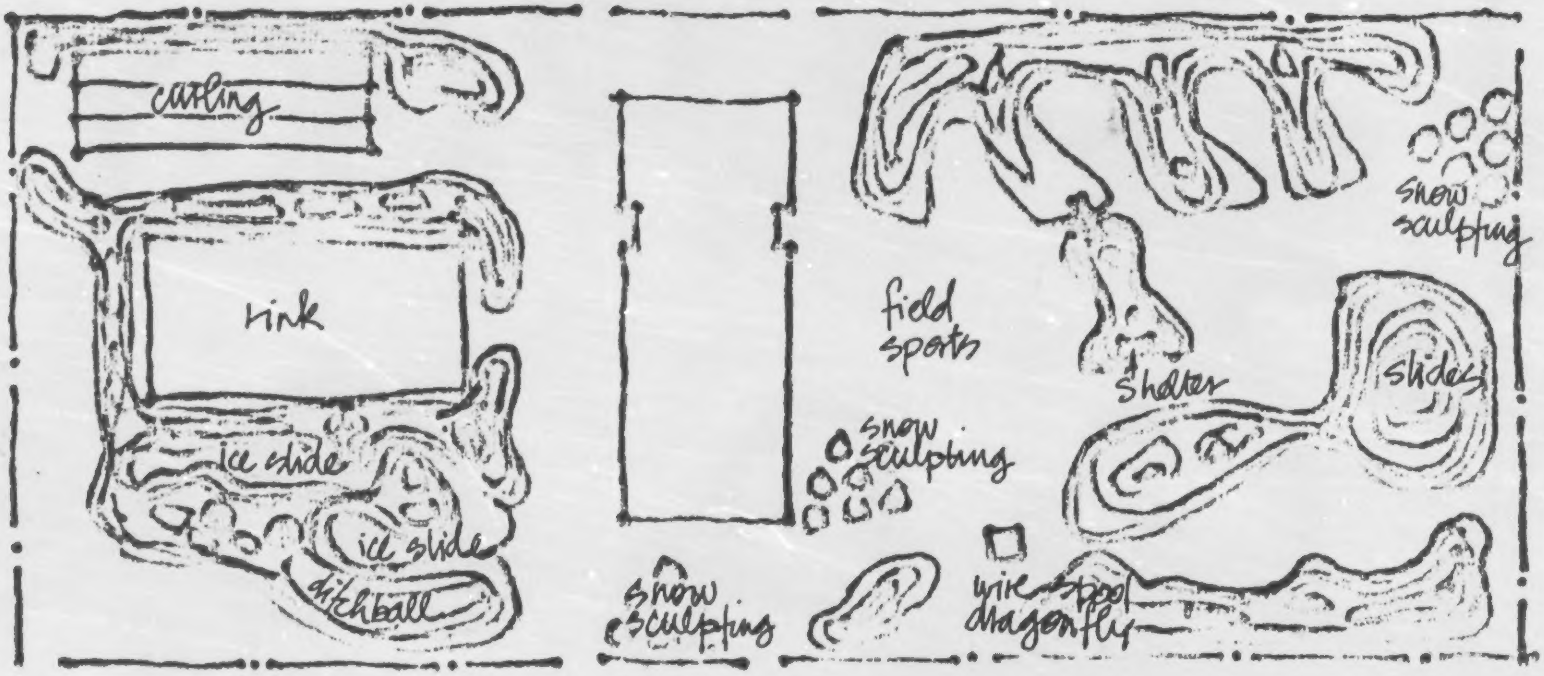
A COPY OF THIS LAYOUT (MINUS THE ANNOTATIONS) WOULD BE GIVEN TO THE PLOUGH OPERATOR AS AN AID.

KRAWCHYK SCHOOL ALTERNATIVE PLAN


ski trail
ditch ball
hockey and skating
existing mounds (future quin-zhee building area with snow fences)
jampail curling
ice sculptures
ice slide
ice maze
field sports
"on route" mounds
stepping stones
balancing logs
shelter
tunnels
ice slides

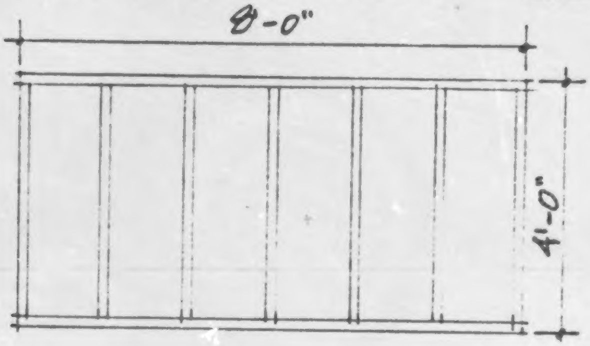
10-15

KRAWCHYK SCHOOL ALTERNATIVE PLAN


curling
rink
ice slide
ice slide
ditchball
snow sculpting
field sports
snow sculpting
shelter
slides
snow sculpting
wire spool dragonfly

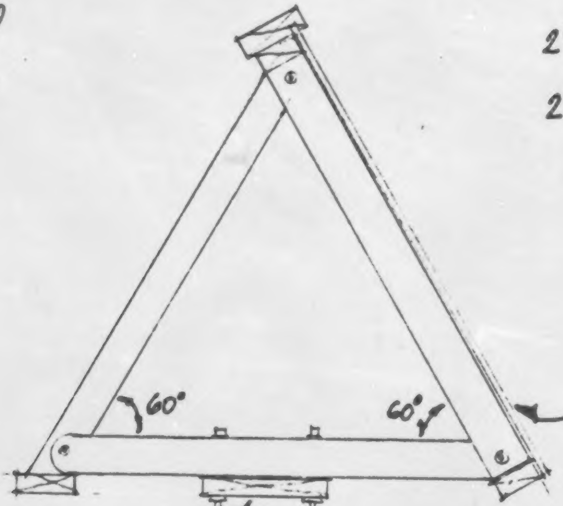
KRAWCHYK SCHOOL ALTERNATIVE PLAN

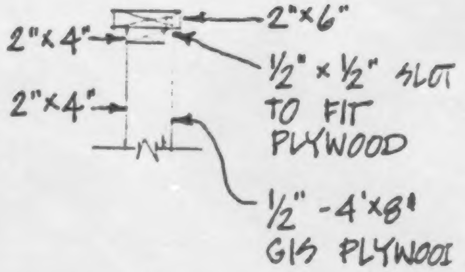
KRAWCHYK SCHOOL DETAILS



2"×4" FRAMEWORK
16" O.C.

LEAN-TO
SHELTER


60°
60°
2"×12" SEAT
PAINTED BLACK
4'×8'×½"
PLYWOOD
PAINTED BLACK
ON INSIDE


2"×6"
2"×4"
½"×½" SLOT
TO FIT
PLYWOOD
2"×4"
½" - 4'×8'
G1S PLYWOOD

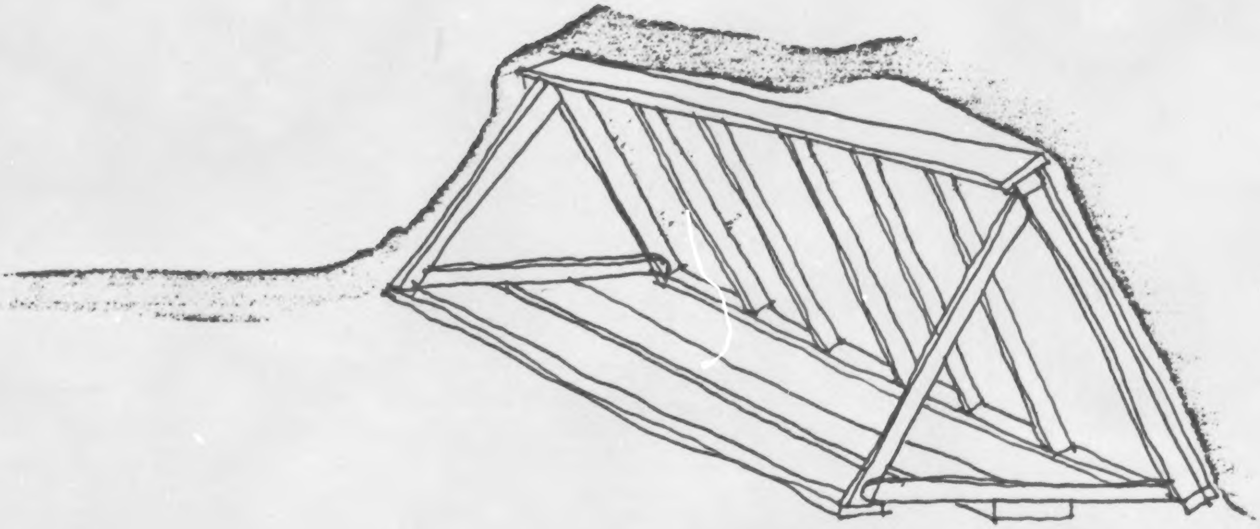
TOP JOINT

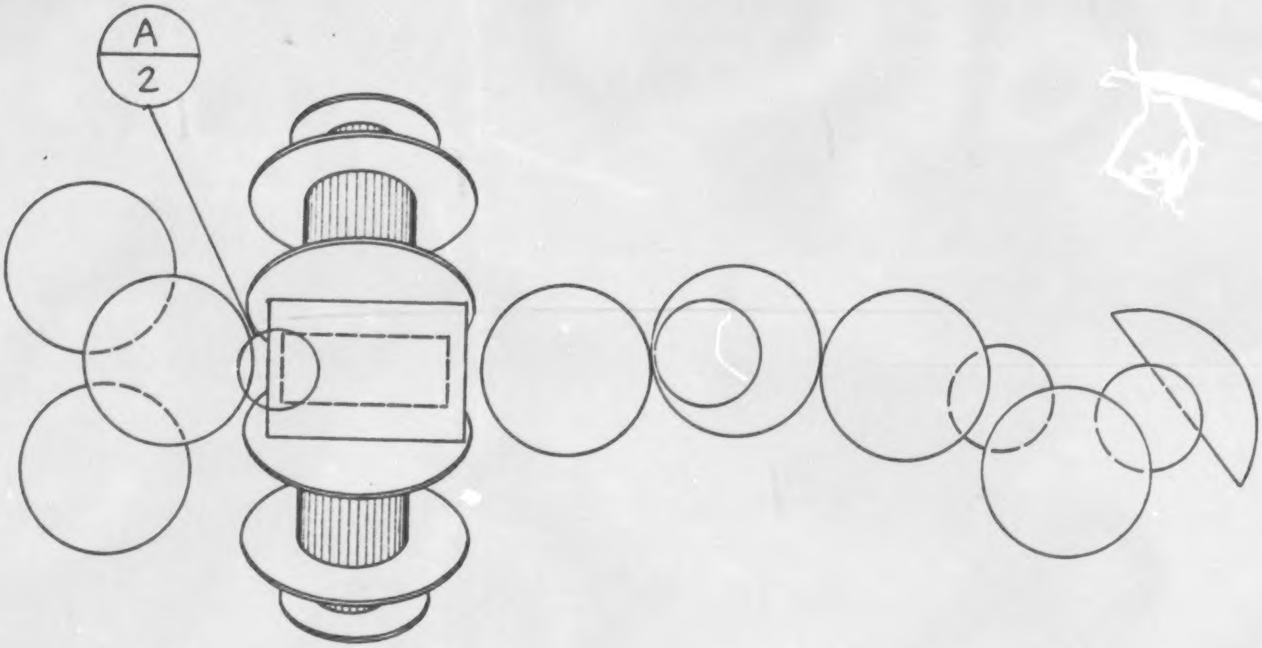
MATERIALS

7	2"×4" @ 8'
3	2"×4" @ 6'
2	2"×6" @ 8'
1	2"×12" @ 8'
1	4'×8'×½" PLYWOOD G1S
3	½"×6" HEX BOLTS W/NUTS
10	½"×5" HEX BOLTS W/NUTS
36	WASHERS 1½" OUTSIDE DIAMETER ½" INSIDE DIAMETER HOLE

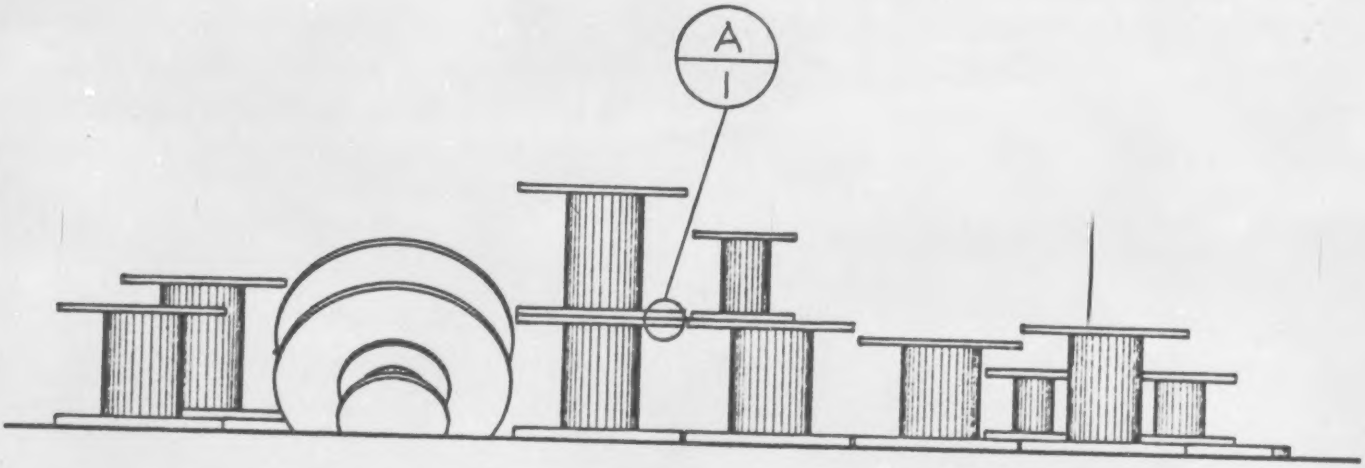
3" COATED NAILS
1½" COATED NAILS
BLACK PAINT

SKETCH OF
LEAN-TO
SHELTER

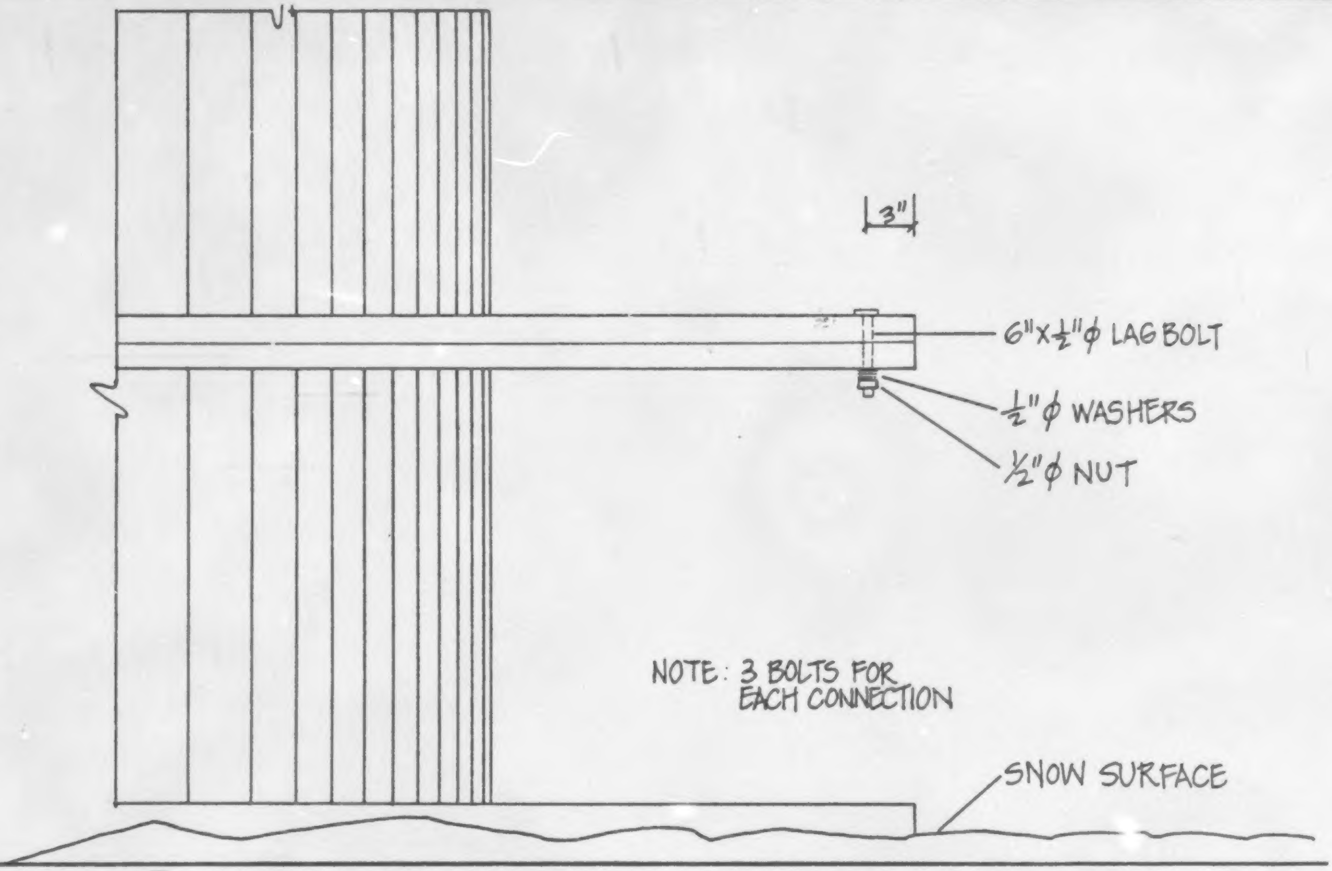




THE DRAGONFLY PLAN
NOT TO SCALE



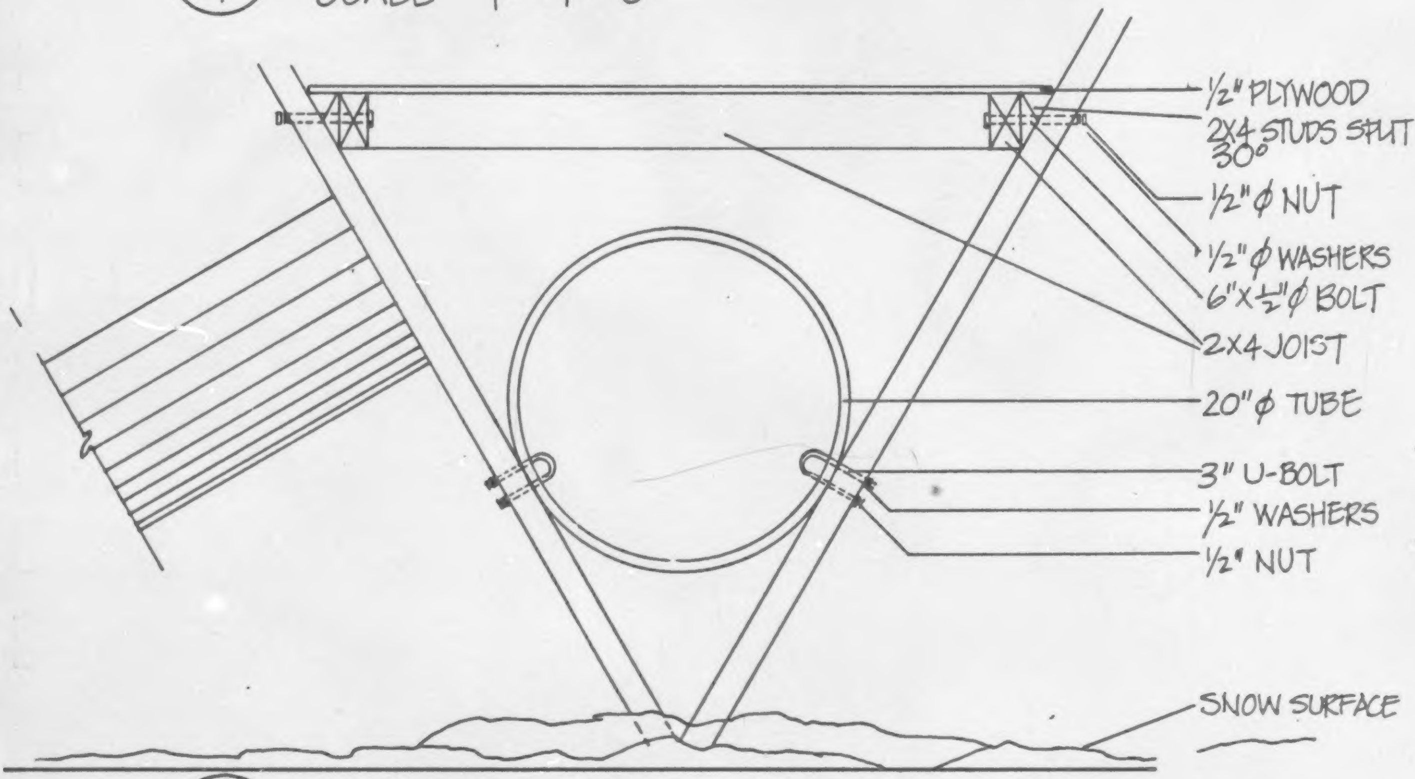
THE DRAGONFLY ELEVATION
NOT TO SCALE


3"
6"x½"ϕ LAG BOLT
½"ϕ WASHERS
½"ϕ NUT
SNOW SURFACE

NOTE: 3 BOLTS FOR EACH CONNECTION

A
1

TYPICAL JOINT
SCALE 1"=1'-0"


½" PLYWOOD
2X4 STUDS SPLIT 30°
½"ϕ NUT
½"ϕ WASHERS
6"X½"ϕ BOLT
2X4 JOIST
20"ϕ TUBE
3" U-BOLT
½" WASHERS
½" NUT
SNOW SURFACE

A
2

BRIDGE & TUNNEL DETAILS
SCALE 1" = 1'-0"

10-20

DESIGNED AND DRAWN BY JAMES LAI & NORBERT BADIOI
1980

WORKBOOK FOUR

11.1 PLANTS AND A WINTER PLAYGROUND

The functions to be fulfilled by plants in a winter play environment are varied. One should consider such things as the arresting effect of red twigs against white snow, or berries hanging heavily from delicate networks of bare branches, or the warm colours of grasses holding their own against a cold world. Of importance, also, are the birds that come to feed at certain trees, the history to be learned by looking at a plant and coming to know how it was used, the food and drink that came from its flowers and fruits, and the ways in which plants mark the changing of the seasons, providing a transition through colours and flowers and fruits and making visible the continuity of growth.

"I know of no object more unsightly to a careless glance than an empty thistle-head, yet, if you examine it closely, it may remind you of the silk-lined cradle in which a prince was rocked." p. 112

Henry David Thoreau quoted in Catheri K. Young, To See our World, GLC Pu- lishers Limited, 1979.

The plant lists compiled here, are but a beginning in terms of those plants that could be used in a play environment trying to take advantage of winter. There are many other plants that should be used in a playground, but those listed have been chosen for very definite winter interest. The bias has been to the selection of native materials, since many of them are a natural aspect of a prairie winter. They also provide an environment that does not have to be "protected" from the exuberance of children, but rather belongs to them.

"When the goldenrod flings its velvet cushions along the edge of the copse, or when the dandelion spangles the meadows, they are things of beauty as well as any tulip or tiger-lily." p. 67

Frederick Philip Grove, Over Prairie Trails. (Toronto: McClelland and Stewart Limited, 1957).

There are six categories of plants. Autumn plants include those of interest beyond summer flowering, those that flower into the fall, and those that acquire interesting colours.

Plants of visual interest in winter include those with striking skeletons, coloured branches, persistent berries, and grasses. The grasses were chosen mainly, for their height and their ability to lend a soft and warm texture to the landscape. (They should be cut back to the ground in early spring just before new growth begins.)

"The season of hope and promise is past; already the season of small fruits has arrived. We are a little saddened, because we begin to see the interval between our hopes and their fulfillment. The prospect of the heavens is taken a and we are presented only with a few s berries." p. 75

Henry David Thoreau quoted in Catheri K. Young, To See our World, GLC Pu- lishers Limited, 1979.

Early spring plants are those which flower in April and May, providing signs of approaching warmth and quickening growth.

The last three categories could be listed under the title of environmental education. Several of the plants of winter interest provide food that can be consumed by people. There are also those plants that, throughout the winter, provide food for birds and insects. Finally, those plants which provide good examples of insect galls are listed.

Following these lists, the plants are briefly described, with an explanation given of their major "winter play area" characteristic.

11.2 PLANT LISTS

AUTUMN PLANTS

Anemone patens	Prairie Crocus
Aster laevis	Smooth Aster
Aster pansus	Many Flowered Aster
Helianthus laetiflorus	Rhombic Leaved Sunflower
Oenothera biennis	Yellow Evening Primrose
Rudbeckia serotina	Black-eyed Susan
Solidago canadensis	Goldenrod
Parthenocissus quinquefolia Englemanii	Self-clinging Virginia Creeper
Rhus typhina	Staghorn Sumac
Acer ginnala	Amur Maple
Acer spicatum	Mountain Maple
Acer tataricum	Tatarian Maple

WINTER VISUAL INTEREST

Achillea millefolium	Yarrow
Asclepias syriaca	Common Milkweek
Chimaphila umbellata	Pipsissewa
Oenothera biennis	Yellow Evening Primrose
Rumex occidentalis	Western Dock
Cornus stolonifera	Red Osier Dogwood
Fraxinus nigra	Black sh
Malus sp.	Crabapple
Salix alba sericea	Siberian White Willow
Salix alba vitellina	Golden Willow
Sorbus sp.	Mountain Ash
Grasses	

EARLY SPRING PLANTS

Anemone patens	Prairie Crocus
Cerastium sp.	Chickweed
Ranunculus rhomboideus	Prairie Buttercup
Viola adunca	Early Blue Violet
Viola pedatifida	Crowfoot Violet
Arctostaphyllos uva-ursi	Bearberry
Salix discolor	Pussy Willow

FOOD FOR PEOPLE

Asclepius syriaca	Common Milkweed
Gaultheria procumbens	Teaberry
Lepidium densiflorum	Peppergrass
Rumex occidentalis	Western Dock
Shepherdia argentea	Silver Buffaloberry
Acer saccharum	Sugar Maple

ATTRACTING WILDLIFE

Lepidium densiflorum	Peppergrass
Oenothera biennis	Yellow Evening Primrose
Solidago canadensis	Goldenrod
Arctostaphyllos uva-ursi	Bearberry
Juniperus communis	Common Juniper
Salix discolor	Pussy Willow
Acer saccharum	Sugar Maple
Fraxinus nigra	Black Ash
Malus sp.	Crabapple
Pinus sp.	Pine
Symphoricarpos occidentalis	Western Snowberry
Viburnum sp.	Bush - Cranberry

*In the winter half of the diet of the chickadee is the small eggs or larvae of insects and spiders which are nestled in bark crevices. They also eat the seeds from pines and hemlocks. When the snow covers the tops of the branches, they can still hang beneath to gather seeds and insects.

*Winter insects (springtails or snow fleas) are often found at the base of a tree on warmer winter days where the sun has melted through, and where they can come out to feed.

PLANTS WITH INSECT GALLS

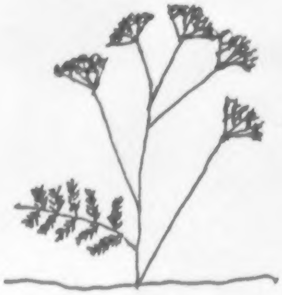
Insect galls are deformations of plants caused by insects and used by them for food and protection while developing. The insect disrupts the normal growth of a plant, either through physical irritation or chemical secretion. The plant grows a deformity around the insect, which the insect then uses for food and protection.

- Elliptical Goldenrod Gall
- Goldenrod Ball Gall
- Goldenrod Bunch Gall
- Oak Gall
- Willow Petaled Gall
- Willow Pine Cone Gall

11.3 PLANT DESCRIPTIONS

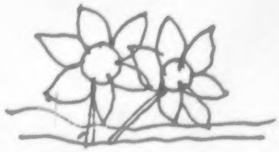
WILD FLOWERS

Achillea millefolium Yarrow



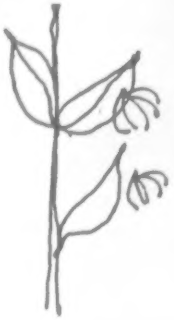
Yarrow is a perennial, flowering from June to August. Its height ranges from one to two feet, and spreads by seeds and shallow roots. The leaves, which are finely cut to resemble feathers, are very fragrant. If the snow is brushed away from the base of the plant and the leaves of the rosette around the stalk are crushed, the smell is very strong and spicy.

Anemone patens Prairie Crocus



These pale blue and mauve perennial flowers are among the first to appear in the spring. The leaves arise from a thick wood taproot, and the plants can persist into September.

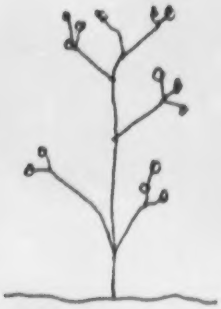
Asclepias syriaca Common Milkweed



This perennial spreads by seeds and underground rootstocks. It can reach a height of from two to four feet. In winter, the pods turn silvery gray on black stems and contain silky seeds. The spring shoots of this plant can be eaten cooked, like asparagus, or raw if they are still young.

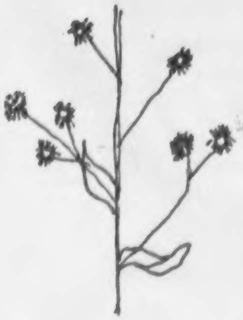
Aster laevis Smooth Aster

The bright, violet-blue flowers of this perennial appear with dark green, thick leaves. The height ranges from one to four feet, and the plant has a tendency to flop. Flowers last from late July to late September.



Aster pansus Many Flowered Aster

Small and numerous flowers are found on one side of a curved stem. Clusters of viry, hairy stems arise from a thick rootstock to a height of 8 inches to 24 inches. The leaves of this plant are gray-green and linear. Flowers occur from late July to late September.

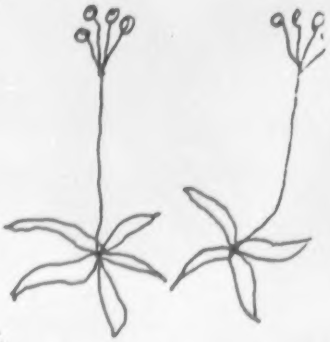


Cerastium sp. Chickweed

The small, white flowers of these perennials appear early in spring. Because the stems are semi-prostrate, the height of the plant does not extend much beyond ten inches.

Chimaphila umbellata Pipsissewa

The shiny leaves of this evergreen plant grow in whorls off erect stems up to a height of 12 inches. The plants are found beneath pines and oaks, connected by an underground rootstock. One can often see the flower stalks and seedcases sticking through the snow.

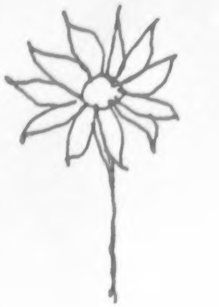


Gaultheria procumbens Teaberry

The bright, red berries of this plant last all winter, but they are generally, hard to see beneath the shiny evergreen leaves. The plant is about 6 inches tall. The leaves and berries contain oil of wintergreen. A good tea can be made by combining equal amounts of boiling water and fresh leaves and letting them sit for a day or two.

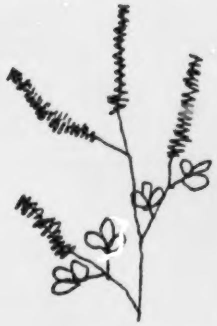
Helianthus laetiflorus Rhombic Leaved Sunflower

The yellow heads of this tall perennial extend from one to three inches. The flower can be seen well into September.



Lepidium densiflorum Peppergrass

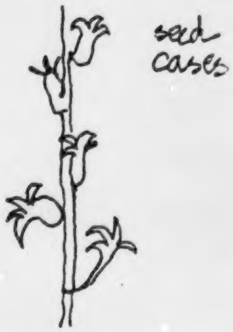
Peppergrass is an annual plant, from 8 inches to two feet high. It seems to appear everywhere in the city, even in sidewalk cracks. The seeds are used by sparrows in winter, but because the winter stalk is brittle, it often breaks off, and is blown about. The spring shoots of those plants grown in controlled conditions provide a good salad green.



Melilotus alba White Sweet Clover

This perennial can reach 7 feet in height. The white flowers which are scented appear from June to August.

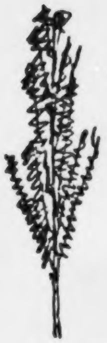
Oenothera biennis Yellow Evening Primrose



This biennial grows from 2 to 6 feet in quite a bushy and branched form. It spreads by seeds. The flowers appear from July to September. In winter, the pods turn deep brown, on darker brown stems. The almond shaped winter fruits are split into 4 sections at the unattached end, and curl back like petals. These cases are often used by insect larvae. The roots of the first year rosette can be eaten, after boiling them twice if they taste too peppery.

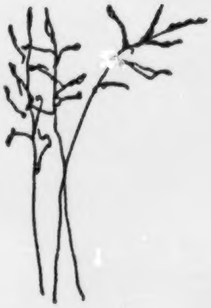
Ranunculus rhomboideus Prairie Buttercup

The light, yellow flowers of this low, eighteen inch plant appear in the early spring.



Rumex occidentalis Western Dock

Dock is a perennial, reaching three feet in height. The fruits are enclosed in dry, papery, reddish-brown sepals, which give the plant a reddish-brown skeleton in fall and winter. New leaves are sent up each fall in the form of a rosette. This can be gathered in winter to produce something similar to spinach.



Solidago canadensis Goldenrod

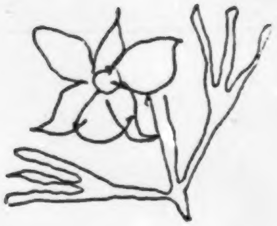
This perennial ranges in height from one to five feet. It provides food for sparrows, finches, and juncos. The flowers last from late July to October. Goldenrods are also important for the Elliptical Gall and Ball Gall which are both found on the stem and are made by moths and flies. A Bunch Gall is often formed at the tip of the stalk.

Viola adunca Early Blue Violet

The stem of this perennial can be up to 6 inches in height. The small, purple flowers appear in early spring.

Viola pedatifida   Crowfoot Violet

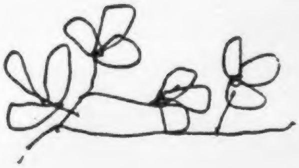
The violet-blue flowers of this perennial appear in early spring. The plant is about 6 inches high. Because the leaves are very finely cleft, the plant is not noticeable in the grass until the flowers come into bloom.



SHRUBS AND GROUND COVERS

Arctostaphyllos uva - ursi   Bearberry

The berries of this ground cover cling to the branches well into the winter. Small, pink flowers appear in the spring. The leaves are about one inch long, egg-shaped and glossy. If the plant is grown in full sun, the shiny, green leaves turn bronze in winter. Large plants do not transplant readily from the wild. Small divisions or newly rooted runners provide a better approach.



Cornus stolonifera   Red Osier Dogwood

This shrub assumes a broad and oval form, and can reach 7 feet in height. The twigs of this shrub are very apparent in winter for their bright, red colour. Old branches tend to become browner, but if they are removed the new shoots will possess the red bark.

Juniperus communis   Common Juniper

This juniper is a two foot high evergreen shrub. It spreads out from its centre, and provides winter cover for birds who eat the berries and nest in the foliage. The juniper should be kept out of the early spring sun by not giving it a southern exposure.

Parthenocissus quinquefolia   Self-clinging
Englemanii   Virginia Creeper

This vine acquires a good, bright-red foliage in the fall if it is grown on south or west walls.

Rhus typhina   Staghorn Sumac

The staghorn sumac is a shrub noteable for its autumn coloration.

Salix discolor Pussy Willow

This shrub is famous for its catkins which can be collected early in the spring. It is the home of two insect galls - the Willow Petaled Gall and the Willow Pine Cone Gall.

Shepherdia argentea Silver Buffaloberry

This is a thickly, branched shrub reaching a height of from 7 to 15 feet. The berries remain on the shrub after the leaves have fallen off; and after a frost can be used for jelly. They are much sweeter at this time. However, they should be used in a limited way, because of a high saponin content which can cause irritation of the digestive system.

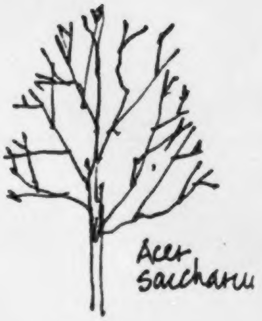
TREES

Acer ginnala Amur Maple

The amur maple is a 15 foot high tree, excellent for autumn colouration that ranges from bright-scarlet to deep wine-red. When plants are exposed to full sun, the best leaf colouration occurs.

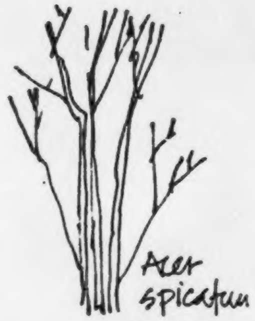
Acer saccharum Sugar Maple

This 40 foot tree is round-headed and requires a protected location. The buds and flowers are eaten by grosbeaks, purple finches, nuthatches. It is important in the production of maple sugar.



Acer spicatum Mountain Maple

The mountain maple grows to about 10 feet. Its autumn colouration is striking. As well, during the summer, its bright-red samaras are conspicuous.

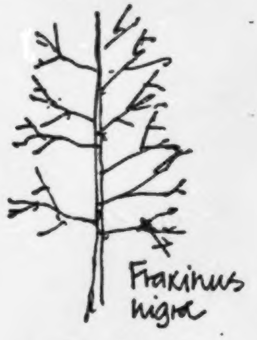


Acer tataricum Tatarian Maple

The tatarian maple, a 20 foot tree, is notable for its autumn colours. Also, its fruit and petioles are bright-red throughout the summer.

Fraxinus nigra Black Ash

This is a 30 foot, slow growing tree with ascending branches. Its fruit has an elongated wing and often persists over the winter. Finches, grosbeaks, and cardinals eat the seeds in fall and early winter.



Malus sp. Crabapple

The crabapple is a medium sized tree. It is attractive to wildlife, as it sometimes holds its fruits throughout the winter.

Salix alba sericea Siberian White Willow

This willow has an upright spreading head. The undersides of the leaves have silky hairs which give them a silvery-white appearance. As the tree grows older the trunk becomes a warm-orange colour.

Salix alba vitellina Golden Willow

The golden willow is a 30 foot, round topped tree. Its bright and yellowish bark stands out in winter and early spring.

Sorbus sp. Mountain Ash

The mountain ash is a deciduous tree with dark-green foliage and showy clusters of fragrant, white flowers and scarlet fruit. The fruits persist throughout the winter.

GRASSES

Agrostis stolonifera Red Top

Red top is a perennial grass about two feet in height. It has feathery seed heads.

Andropogon gerardi Big Bluestem

The big bluestem is a tall coarse grass evident in the winter because of the lignification of its stem.

Andropogon scoparius Little Bluestem

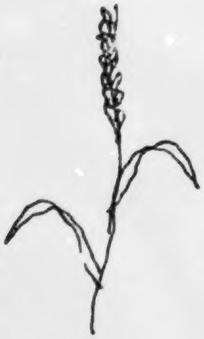
The little bluestem is an erect, purplish grass with short, broad leaves.

Bromus ciliatus Brome Grass

Brome grass is a perennial grass, 2 to 4 feet in height.

Calamovilfa longifolia Sand Grass

Sand grass is a coarse grass with long, tough leaves and long, creeping roots. It is a perennial and grows from two to five feet in height.



Elymus canadensis Wild Rye

Wild rye is a perennial grass, 3 to 5 feet in height. It has tufted and nodding seed heads.

Panicum virgatum Switch Grass

Switch grass is a bluish-green grass with creeping roots. It is perennial, and grows 3 to 6 feet in height.

Poa pratensis Blue Grass

This is a dark-green perennial grass, 1 to 4 feet in height.

Sorghastrum nutans Indian Grass

The long, flat leaves of this grass taper to sharp points. It is a perennial, 3 to 8 feet in height.

LITERATURE REVIEW

LITERATURE REVIEW

A.1 PLAY

B.1 CLIMATE

C.1 WINTER AND ENVIRONMENTAL EDUCATION

D.1 PLANTING, PLAYGROUNDS AND WINTER

E.1 WINTER ON THE PRAIRIES

This literature review will begin with a quote from an article which holds within it the germ of a philogophy of play. While the article does not deal specifically with winter play, it does deal with play in a way that makes it at once universal and individual, at once for all time and for this time, at once play of the imagination and play anchored in the urban reality. A concern for winter play would imply such a philosophy.

"Making places and repairing contexts is an art of orchestration of parts to form a living whole. . . . A street that is a hearth of play is one in which the contours of dwellings create the possibility of different currents of movement along the street, different rhythms of flow. . . . The material imagination of children works, even thrives upon a fodder of natural and cultural materials that lie in profusion and glorious disarray in the abandoned lots, warehouses, wharfs, and workbins - the reliquaries and vegetal graveyards of the city."

Little has been specifically written about play in winter - either climatic influences on play or those elements of winter which could be harnessed to enrich play. A wealth of sources does however exist on the subject of play and playgrounds. For the purposes of this study a few have been chosen to serve as basic reference texts. They range from those general sources, such as Richard Dattner (4) and Laddy Allen of Hurtwood (1), who provide a discussion of the theories of play, strategies, programs and equipment, to sources considering play within the expanded context of the city as it relates to the education and growth of the child. These include such sources as Pollowy (12) and Bengtsson (3), who shows responses to certain design conditions through examples of developments in which play areas are totally integrated and are often one of the elements providing cohesion.

Several references contain information in the form of general design guidelines. In her article, Clare Cooper Marcus attempted to organize "some of the behavioural and attitudinal data pertaining to children in such housing". (9) Robin Moore (11) deals with playgrounds in all locations and offers guidelines under the following titles - location and spatial form; diversity; facilitation of social groups; fixed elements; loose resources; combination of fixed and loose resources; role of adults. The guidelines in the University of Illinoise publication (8) try to incorporate the recreation characteristics and needs of various age groups. They also deal with surfacing materials, wind protection and advocate the importance of evaluation and maintenance.

Other references contain guidelines based on specific research studies. The Department of Environment (England) study details research carried out in 15 housing developments. Its purpose was to provide guidelines which would ensure that play be considered in the initial stages of design (5). In the study described by Vere Hole (6) 12 housing estates were examined and the purpose was to discover the use of space around the buildings for play. Holme and Massie (7) outline three surveys - one of two contrasting neighbourhoods, one of ten boroughs, and a survey of existing facilities in 19 boroughs - and make the statement that "Freedom to play is a casualty of an increasingly restrictive urban environment".

Some of these sources deal with winter play but only in a very cursory way. Most automatically accept the outdoors and nature as an invaluable part of the play experience, but this is usually based on a view of summer being the most important or flexible season of the year. There are only general statements about the importance of designing for all seasons.

Katherine Read Baker and Peggy Miller provide comprehensive descriptions and broad views of play and the outdoors. Through their descriptions of specific outdoor elements (sun, mounds, gardens) they outline a philosophy of allowing a child to learn and experience the most that he can. Although the book by Peggy Miller (10) contains some highly structured and designed areas (logs cut into predetermined shapes, pieces such as culverts and automobiles that might have limited play potential) it is valuable for the way it relates activities to pieces of equipment which will accommodate them. For example, for climbing one can have logs of various heights positioned vertically, or railroad ties secured crosswise in layers to form pyramids, ladder-like structures. The articles by Zuk (14, 15) deal specifically with the winter environment and suggest ways of increasing the utilization of the outdoors.

Out of all this information there are a number of points which present themselves over and over again and which have shown themselves to be of importance in considerations of winter play.

The necessity of a comprehensive view of play - climatic and social - is evident (2, 5, 8, 11). A play area must be considered as one place among many in the continuous play space that is the neighbourhood (11). When play is not considered an integral part of the design, but is an afterthought or is thrown into left-over areas, valuable opportunities are missed, such as for example, widening the junction of a footpath to create a play area (8).

Children play everywhere (9). They "will be attracted to the safe interior landscaped areas . . . only if they are more interesting as play spaces than the surrounding roads or parking areas" (9). Vere Holé (6) found that successful play areas had pedestrian paths leading past, through, or into the playground. Play areas are best located in the midst of other activities (2).

Also site features are liable to be used in play (2) and should be designed with this in mind (5). Further, it is important to decide if planted or grassed areas must be protected from children (9). In any case, all components of the built environment should be emphasized for incidental play opportunities (12).

Theories and views of play have undergone a great deal of change (7). The physiological bias of play theories, prior to 1900, gave way to theories which held play to be something apart, transcending immediate needs of life, but also being an inseparable part of development and socialization (7). Play, Piaget says, is part of the child's response to his environment, and so it is important to provide an environment which will allow development of the child's potential. "Play is essentially like a person hiding who now and then gives a sign of his presence, only to disappear again in the next instant." (7)

One cannot dispute that "play is essential to the development of (a) basic motor skills including perceptual-motor development and physical fitness and growth; (b) mental skills; (c) social skills; and (d) emotional maturity." (10) Play equipment should be selected in terms of the complexity and variety it offers. (2, 5, 6, 8, 13, 14). Nothing should be a separate activity within itself. Equipment should allow a number of options (8). While it has been found that some conventional types of equipment should be maintained for younger children (based on several studies, Pollowy, p. 137) it is important also to make provision for loose materials, things that can be taken apart, built in a variety of ways (12, 15). Play equipment should be designed for use by several children simultaneously (12).

An interesting consideration arises in the examination of the time spent at activities. Vere Hole (6) found they were usually short. There was a great deal of moving on, changing, coalescing, dissolving. The University of Illinois (8) found that there were far greater lengths of time spent in fields and junkyards whereas the average time spent in a playground was 15 minutes (p. 17). This is probably because the skills in a playground are easy to master, but the fields present complex opportunities and it is difficult to do the same thing twice.

One must provide areas both for very active play, and those activities requiring quiet, sheltered enclosed areas. In his study Vere Hole (6) noted a great deal of inactive play, sitting on door stoops, etc.. However, all types of areas can be utilized for either active or inactive play (8).

There are general guidelines which can be applied in this area. Flat barren play areas may be good for the sports activities of older children, but restrict the explorations of the younger children who require the variety of hills, grass, cobbles. (14) Further to this, large open areas tend to encourage robust activities, while small areas lend themselves to quiet play (12, p. 138-139).

The design of a playground should respond to the individual situation, especially in terms of climatic protection (2). Landscaping can play an important role in mediating the climate, and in the play experience. Earthmounds can serve both as windbreaks and as play structures. Such an integration, and year-round use are the ideal (2, 10, 8).

Lady Allen of Hurtwood states the "Seclusion and scaling down to the child's size are vital. He must be able to create a world of his own within the framework provided. . . . But however the area is placed it should never be starkly unprotected or placed forlorn in the midst of the older children's playground." (1, p. 31). It is important to provide for age ranges and changes, as small children have a habit of growing up (2). One must also give consideration to the increased activity of grade school children as compared with preschool children (8). Pollowy (12) documents these changes from infancy to adolescence through four areas - physical growth and activity development, personal and social development, intellectual and perceptual development, and design implications. At present the lack of differentiation between areas for use by various age groups is a serious problem. They should be considered separately, but not segregated (12, p. 127).

Pieces of equipment also acquire different uses as children get older. For example, a swing is at first a gentle ride, then becomes a physical challenge, and finally a competitive tool.

Of importance also are the interests of both young and old of the community. (7, p. 79). Children must have areas into which they can retreat, but opportunities for respecting the worlds of others are importand also. Teenagers have a need for peer groups and associations; adults engage in less vigorous and more social activities. The elderly should have areas which are private, yet connected to other areas, visually or physically, where they can sit and watch or become involved in their own activities.

While all these principles are important in a discussion of play, summer of winter, none of the literature (except Zuk) really offers any indication of ways in which adaptations could be made for winter.

With Zuk's articles, we move into more specific winter related information. Snow has a great potential as a building material for outdoor playgrounds, and allows winter playgrounds to be established anywhere. Zuk also stresses the importance of observing and interpreting what children do with the snow and then changing playgrounds accordingly.

A.2 PLAY : SELECTED REFERENCES

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2. Baker, Katherine Read. Let's Play Outdoors. Washington, D.C.: National Association for the Education of Young Children, 1966.

3. Bengtsson, Arvid. Environmental Planning for Children's Play. London: Crosby, Lockwood and Son Ltd., 1970.

4. Dattner, Richard. Design for Play. Toronto: Van Nostrand Reinhold Company, 1969.

5. Department of Environment. Children at Play. London: Her Majesty's Stationery Office, 1973.

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7. Holme, Anthea, and Massie, Peter. Childrens Play: A Study of Needs and Opportunities. London: Michael Joseph Ltd., 1970.

8. Housing Research and Development, University of Illinois at Urbana - Champaign. Play Areas for Low Income Housing. Illinois: Department of Local Government Affairs, Office of Housing and Building, 1974.

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10. Miller, Peggy L. Creative Outdoor Play Areas. Englewood Cliffs, N.J., 1972.

11. Moore, Robin C. "Patterns of Activity in Time and Space: The Ecology of a Neighbourhood Playground." Psychology and the Built Environment. Edited by David Cantes and Terrence Lee. New York: John Wiley and Sons, 1974.

12. Pollowy, Anne-Marie. The Urban Nest. Stroudsberg, Pennsylvania: Dowden, Hutchinson and Ross, Inc., 1977.

13. Zerner, Charles J. "The Street Hearth of Play: Children In the City." Landscape, Autumn, 1977, pp. 19-33.

14. Zuk, William M. Early Childhood Development: An Orientation to the Planning of Outdoor Play Environments.

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In the same way that it is important to base conclusions on certain principles of play, so a number of sources were consulted for principles regulating the relationships among climate, man and his environment.

One can distinguish a number of categories within this section. There are two books which are standard references for the relationship of the built environment and climatic influences - Olgyay (8) and Geiger (3) - and a third, Robinette (9), which draws upon the first two and releases them in the form of design guidelines.

Geiger (3) concerns himself with the microclimate, which he describes as follows:

"All the meteorological elements are subject to vertical changes because of the nearness of the ground and in a similar way they also vary horizontally within short distances. These variations are brought about by changes in the nature and the moisture of the soil, even by minute differences in surface slopes, and by the type and height of vegetation growing on it. All the climates found within a small space are grouped together under the general description of microclimate . . ."

Although he offers very detailed and complex discussions of, for example, the laws governing the processes in the air close to the ground, one can find very valuable points for both the large scale and fine scale design of playgrounds. The melting of snow around tree trunks is explained, as is the microclimate of gardens, potato fields and vineyards. (The temperature profile of a flower bed in August, when the plants are fully grown and with a dense leaf structure shows the zone of maximum temperatures raised to a higher level much more markedly than in grain with its vertical type of structure.)

Olgyay (8) presents climatic information in a general manner, of use mainly on the larger scale of site planning. He does, however, deal also with wind patterns around building, sun and shade, and indigenous methods of solving these problems.

Robinette (9), while he does offer a great deal of pure climatic information, has produced a book which is more valuable for its design guidelines and design examples. Much of the climatic information is very specific, often to forest conditions since it seems that so many of these studies are done from the vantage point of botany, or forestry. One finds out that shelter belts with a "pitched roof" cross-section are less effective in halting winds than belts with more or less vertical edges, or velocity reduction patterns for pampas-grass, foliated 3-year old Lombardy poplar, and Russian mulberry barriers at Colby, Kansas. However, through the exhaustive covering of so much, and the repeated emphasis on a number of objectives for each climatic type, Robinette provides a useful design checklist.

A number of articles in architectural and planning journals provide much similar information and emphasize the need for that information to be part of any design process.

In his manual on the sun, Burberry (1) provides information on deriving sunpath diagrams, on estimating the effect of shading devices, on sun control, stating that "Designers of buildings need definition, in relation to modern conditions, of the need for sunlight in terms relevant to the design process; and values which make it possible to assess sunlight in relation to other factors which must be considered."

The articles by Shellard and Manley are general discussions of microclimate and planning with the invaluable detail that must come with it. Along with hills and winds, and orientation as affects heat, light, wind, the effects of the nature of soil and the soil covering are described. (The soils of the lowest conductivity have the greatest temperature ranges at their surfaces, but are affected to the least depth. Conductivity is increased by an increase in moisture and a decrease in air content. Grass or snow reduces the depth to which cooling will penetrate the ground.)

The second group of books is similar to the first in its applications, but the climatic information is presented as part of the total planning process.

Boris Culjat's book (2) is the result of work on the design of northern communities and thus contains mainly information on the planning of larger areas. He attempts to develop a philosophy of design for colder climates that would move beyond the existing approach which emphasizes mainly climatic modification and satisfaction of physiologic requirements. His proposed approach works towards maximization of positive and minimization of negative climatological elements towards satisfaction of existential requirements.

In his work Culjat identifies specific characteristics of the cold climate and their influence on the built environment and human behavior, with applications in a case study - the planning of the new town of Resolute Bay, Cornwallis Island, N.W.T.. Ideal part solutions are developed for four separate aspects of the cold climate - wind, solar radiation, temperature and precipitation. These four aspects are described under the headings of location, relation to other environmental elements, orientation, form and organization, and materials. For example , location influences the amount of solar radiation through latitude, altitude, direction of slope, angle of slope, obstruction from clouds or surroundings, reflection from surroundings.

Climate affects not only physical environment but also the social environment. Outdoor spaces should work during cold times as well. In fact the cold climate has positive aspects - far beyond even the changes of the seasons or the beauty of the winter landscape. There are dangers in separation from the natural environment. Ultimately, also, the built environment should respond to climatic change in a more meaningful way at a smaller scale. Culjat gives the example of lemon tree orchards in northern Italy. The basic structural system consists of terraces and of a post and beam framework. During the winter when the air temperatures become too low, but the sun is still strong, this structure is covered with glass and the hills are filled with greenhouses.

Kevin Lynch (5) deals with the climate as one aspect of site planning. His approach therefore, ranges from considerations of orientation to heat characteristics of materials, and climatic effects of plants.

The third set of references contains sources that concern themselves with specific winter characteristics. As a complement to the general climatic information it is important to deal with those individual elements of winter - snow, ice, wind, sun - their relationships, and ways of increasing or moderating their presence. These elements have characteristics which can be utilized in the general planning of playgrounds and also in the specific design of areas or activities. The new properties formed by their relationships (e.g., snow drifting) can be controlled or harnessed in the creation of play spaces.

Snow offers a number of characteristics which are important in the understanding of its distribution and manipulation. Richter (7) gives an outline of snow, from its formation to ways of manipulating its retention. While the book was intended as an aid for the manoeuvres of the Red Army in the period following the Second World War, the publication is still viewed as one of the best sources for information on snow. Drift formation is related to certain topographic characteristics. Other characteristics such as poor heat conductivity, reflectivity, toughness, density and compaction are important in designing strategies for the change of play areas. As well, one can consider the development of richer play areas, by examining the slipperiness of snow, or the noise and sound emanating from snow.

The information contained in the Harrowsmith Staff Report (2) is based largely on the work of a firm of consulting engineers - Morrison, Hershfield, Teakston and Rowan, Limited. Their services include snow control studies, wind environment studies, solar studies, and engineering investigations. Snow fences can play a large role in directing snow into desired locations, as can the arrangement and relationship of buildings. Much of their work involves studies of snow collection with models and subsequent suggestions for change in configuration or change in location of such elements as doorways.

This application of climatic considerations to farm planning (e.g., snow collection and planning shelterbelts) is extended in the articles of Protz and Moen (5) and Darby (1). The usefulness of these lies in the examples of snow collection through farm layout and fence construction. Farm planning is based on general climatic principles which can be applied in other areas. For example, Darby (1) discusses farm shed construction: "The worst wind situation for an unprotected open-front shed is wind from a 45 degree angle, such as a southwest wind on a south facing shed. Particularly with long sheds, this type of wind will cause draughts to whistle down the length of the shed. To avoid this problem sheds should be divided by interior partitions into sections not exceeding 10 metres in length."

Pruitt (6) gives snow added life by examining the life in winter that depends on it. These ecological considerations, while centered mainly on the boreal forest, become also a way of looking at snow, as something indicative of complex processes.

The two descriptions of ice are included for their way of looking at this phenomenon with such wonder. John Miller's article (3) is a description of ice and its characteristics that begins with remembrances of the iceman and huge blocks of ice in which the author's sister could see people figure skating. He describes the consternation caused the beavers by the formation of lake ice, which departs in as sudden manner as it appears, taking its leave with hissing and tormented moving and buckling.

The mechanisms of its formation (freezing in columns) and the changes (such as frazil ice which is the slush of needles brought to shore by wind and waves smashing newly formed ice crystals) are described also by Newbury (4). There are further stories, about the increasing clarity of ice the deeper you go because there is more time for the air bubbles to disappear; and about the melting of ice along the crystal boundaries, because impurities are forced into these areas.

The fourth group contains books that have already been discussed in the section on play - Bengtsson, Hole, Marcus, and Housing Research and Development at the University of Illinois. These four sources made a concerted attempt to outline the effect of climate and climatic modifications on play areas - such things as intergration of climatic protectors and play elements. Although the subject of winter play is not touched on very directly, the guidelines presented in these sources provide a climatic framework for winter design.

Thus the literature, except for those few pieces pointed out, does not deal directly with climatic factors and play environments, but does explore the factors on a general basis which can be applied. In the main, general objectives and principles are delineated - e.g., providing areas of sun in winter by placing activities against south and west walls of buildings, or using heat retaining materials.

The references, then, would seem to indicate the importance of understanding both the small and large scale mechanisms of the climatic factors and making them an integral part of the design process.

B.2 CLIMATE: SELECTED REFERENCES

B.21 CLIMATE

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Shellard, H.C. "Microclimate and Housing." Architect's Journal, 141, 1, 21-26.

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B.22 CHARACTERISTICS OF WINTER ELEMENTS

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Harrowsmith Staff Report. "The Best Defense is a Good Snow Fence." Harrowsmith, IV:4 (December, 1979), 60-65, 69-73.

Miller, John W. "Knowing Ice." Audubon, 82:1, January 1980.

Newbury, Dr. Robert W. "Melting Manitoba." Manitoba Nature, 16:1 (Spring, 1975), 4-7.

Protz, A. and Moen, P. Owen. Farmstead Planning. Ottawa: Agriculture Canada Publication No. 1674, 1979.

Pruitt, William O. Jr. "Life in the Snow." Manitoba Nature, 14:4 (Winter, 1973), 3-11.

Richter, G.D. Snow Cover, Its Formation and Properties. Moscow: Publishing House of the Academy of Science, 1945.

C.1 WINTER AND ENVIRONMENTAL EDUCATION

The components of winter can also serve in fostering an awareness of the land around, especially of the living processes existing in both summer and winter. The manner in which playgrounds or schoolgrounds are developed for winter use is also dependent on a philosophy of environmental education, i.e., considering what can be learned about winter from the way in which elements are organized; considering the ways in which relationships can be made more obvious.

Thus, characteristics of the winter climate can be studied for themselves, but also for what they indicate about other phenomena and for the secrets they contain. For example, frozen over ponds act to protect dormant life forms waiting for warmer temperatures.

The two sources listed (only two of a possible multitude that are used in schools) are books valuable for the programs they describe. They should, in fact, be read as a prerequisite to design, not only for the wonder they inspire about winter, but also for their ideas about winter environments open to exploration and learning.

C.2 WINTER AND ENVIRONMENTAL EDUCATION: SELECTED REFERENCES

Minnesota Environmental Sciences Foundations Inc. Snow and Ice: An Environmental Education. National Wildlife Federation.

Phillips, R.E. and Watson, C.A. Winter Investigations: Teacher Resource Manual. Winnipeg: Enviro-Concerns, 1977.

D.1 PLANTING, PLAYGROUNDS AND WINTER

An outdoor environment that is intended to function over winter requires special considerations in terms of planting. In addition, a playground environment has its own set of conditions with regard to planting.

There are few references that offer specific information on the best planting for playgrounds. The sources listed give some general criteria. Plant material should be selected and sited so as to allow maximum use of the area for play and to minimize maintenance problems, while providing a variety of colours and textures. Planting could be used to divide the different sections of the play area, but it is important to maintain visual access. Planting could be destined for shelter, for climbing, or simply for seeing the light filter through the branches.

More specific guidelines also exist. Trees should not be planted close to organized games areas. Small trees in open positions should have guards (fences or walls). Planted areas next to hard surfaces should have wooden edges, raised borders or retaining walls.

Appropriate plants are thus identified in terms of general characteristics, with only two of these references giving specific plant lists. Arnold gives a plant list for the northeastern United States with the proviso that selection of materials would depend on the type of playground surroundings and other factors. The annotated plant list given in the University of Illinois publication, while not directly applicable to this area, shows a good method of setting one up. The only problem in both seems to be the lack of information on specific attributes of these plants with respect to playgrounds.

There are a number of references that offer suggestions for winter planting that will leave winter not a forgotten season, but rather one with colour, texture, and other attributes such as attracting wildlife.

The sources listed in the "Winter and Planting" are primarily of gardening interest (except 2 and 5) and, thus, the greatest emphasis seems to be on visual effect. However, another important aspect of appearance would be the role the planting would continue to fulfill as a barrier, or in the creation of spaces.

Appearance would also include colour and texture. Noting changes in appearance from season to season would provide valuable lessons in biology and in the workings of different environments. Certain plants through their uses would provide introduction to historical application. In addition, certain types of vegetation serve in attracting wildlife.

D.2 PLANTING, PLAYGROUND AND WINTER: SELECTED REFERENCES

D.21 PLANTING AND PLAYGROUNDS

Lady Allen of Hurtwood. Planning for Play. Cambridge, Mass.: The MIT Press, 1968.

Arnold, Alan F. "Ornamental Planting for Playgrounds." The Playground, December, 1925, pp. 519-520.

Grey, A. Learning Through Play. New Zealand Playcentre Association Inc., 1974.

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Housing Research and Development, University of Illinois, Play Areas for Low Income Housing. Department of Local Government Affairs, Office of Housing and Buildings, 1974.

Marcus, Clare Cooper. "Children in Residential Areas: Guidelines for Designers." Landscape Architecture, October, 1974, pp. 372-376.

D.22 WINTER AND PLANTING

Allen, Oliver E., and the editors of Time - Life Books. Winter Gardens. Alexandria, Virginia: Time - Life Books, 1979

Brown, Lauren. Weeds in Winter. New York: W.W. Norton and Company, 1976.

Lawrence, Elizabeth. Gardens in Winter. New York: Harper and Brothers, Publishers, 1961.

Nicholson, Robert. Colour in Your Winter Garden. Vancouver: Douglas, David, and Charles, 1973.

Stokes, Donald W. A Guide to Nature in Winter. Toronto: Little, Brown and Company, 1976.

Taloumis, George. Winterize Your Yard and Garden. New York: J.B. Lippincott Company, 1976.

E.1 WINTER ON THE PRAIRIES

These sources include only a taste of the information that exists about those historical winters that have attracted themselves to the mystique of the prairie landscape and those present winters clothed in a romance that makes them an integral part of the prairie soul.

Morley Callaghan's text (1) to John de Visser's photographs has some of the very special winter memories - a father teaching his son to skate, the old man on a street whose special delight it was to shovel other people's driveways, remembrances of winter nights which gave the exuberance for endless party-going.

Grove's work (2), as Roy's (4) is an important piece of Canadian literature with fascinating winter imagery. Grove's essays describe several trips made between two small Manitoba towns over the space of a year. The most arresting are those of the winter with its vagaries, mysteries and secrets.

Kurelek's book (3) holds those paintings which capture the activity and imagination special to winters of play.

E.2 WINTER ON THE PRAIRIES: SELECTED REFERENCES

Callaghan, Morley and de Visser, John. Winter. Toronto: McClelland and Stewart Limited, 1974.

Grove, Frederick Philip. Over Prairie Trails. Toronto: McClelland and Stewart Limited, 1957.

Kurelek, William. A Prairie Boy's Winter. Montreal: Tundra Books, 1973.

Roy, Gabrielle. Where Nests the Water Hen. Toronto: McClelland and Stewart, 1961.

PROJECTS SUPPORTED BY CMHC AS PART OF THE RESEARCH AND DEVELOPMENT PROGRAM UNDERTAKEN BY THE CHILDREN'S ENVIRONMENTS ADVISORY SERVICE (CEAS) FOR THE INTERNATIONAL YEAR OF THE CHILD

The research reports from the following projects are available through the CEAS Resource Service from CMHC National Office and CMHC Regional Offices.

1. INTERNATIONAL INVENTORY AND COMPARATIVE STUDY OF LEGISLATION OF PLAY SPACES

   This will provide a basis for comparison of CMHC standards and policies with those of other countries, regarding the allocation of space for children in the residential environment and is seen as a resource for municipalities establishing such standards.

   Aussi disponible en français.

2. HOUSING CANADA'S CHILDREN - A DATA BASE

   The compiled statistics will provide a profile of Canadian children and their housing.

3. MAINTENANCE AND RETROFITTING COSTS OF CHILD-RELATED FACILITIES IN THE REAL ESTATE PORTFOLIO

   Life cycle costing of child-related facilities and maintenance costs due to lack of child-related facilities will be used to determine cost effective solutions.

4. EVALUATION OF EXTERIOR FACILITIES FOR CHILDREN IN THREE LOW INCOME PROJECTS

   The report will provide an evaluation of three approaches to play space design in terms of play experiences, use by different age groups, accessibility, and resident satisfaction, using a technique that allows children to respond naturally.

5. CHILD'S PERCEPTION OF THE NEIGHBOURHOOD

   The study will document how children use selected urban neighbourhoods that vary in character and the influence of the design of the neighbourhood on the children's activities.

6. HOUSING NEEDS OF URBAN NATIVE FAMILIES - A COMPARATIVE STUDY OF CHILDREN'S AND PARENTS PERCEPTIONS

   A study of the needs of native children and their parents in the area of housing, neighbourhood and community, on the basis of which housing strategies can be developed to respond to their needs in the urban setting.

7. WORKSHOP: "HOUSING THE FAMILY IN 2001", FOURTH CANADIAN CONFERENCE ON CHILDREN

   The report deals with the changing family structure, the needs of children and the suitability of present forms of neighbourhood design to house the future family.

8. LOST AND FOUND: RECYCLING SPACE FOR CHILDREN

The study deals with the identification of waste or unused spaces in residential projects and design suggestions to recycle them into play spaces for children.

9. OUT OF THE CELLAR AND INTO THE PARLOUR - GUIDELINES FOR THE ADAPTATION OF RESIDENTIAL SPACE FOR THE CARE OF PRE-SCHOOL CHILDREN

The study will utilize existing knowledge of indoor and outdoor environmental requirements of children in order to accommodate the developmental needs of pre-schoolers in conventional family living space.

10. PRAIRIE WINTER PLAY PATTERNS

The project goal is to provide for children's play during the winter months, and will be conducted in two parts: (a) A study of social and environmental factors influencing children's activities in winter, and (b) A study of climatic, topographical and environmental factors that must be considered in the design of winter play facilities that accommodate physical, social, creative and intellectual play.

11. DESIGN CRITERIA FOR THE DEVELOPMENT OF A SHELTERED PLAY SPACE IN MEDIUM TO HIGH DENSITY FAMILY HOUSING PROJECTS IN THE ATLANTIC REGION

The report will examine the need for sheltered play facilities in high density family housing projects and recommend design details such as location, size, space allocation, construction materials, and play facilities.

12. PROJET PARAPLUIE - A USER GENERATED SHELTER DESIGN FOR THE RECREATION OF SCHOOL-AGE CHILDREN IN A MONTREAL PROJECT

The report will document a procedure that was used to involve school age children and their parents in the design, implementation, maintenance, and management of a sheltered play space, as a possible model for other residential developments.

Aussi disponible en français

13. GUIDELINES FOR THE SELECTION OF CONSTRUCTION MATERIALS, CONSTRUCTION METHODS, LANDSCAPE MATERIALS AND VEGETATION USED IN PLAY SPACES

An inventory of materials, finishes and methods with a description of qualitative characteristics and possible use in a play space in terms of user groups, climatic conditions, availability and maintenance will be produced.

14. PLAY SPACES TO ACCOMMODATE DISABLED CHILDREN

Design suggestions will be developed for an integrated play space that accommodates both disabled and normal children.

15. CHILDREN'S PLAY SPACES ON ROOF DECKS

The study will result in design suggestions that deal with the technical aspects, such as drainage, containment, and control of the microclimate, as well as the provision of stimulating play opportunities for child users.

16. LA SECURITÉ DES ENFANTS VS LA CIRCULATION - AUTO

The study will analyze accident statistics and traffic patterns in selected multiple housing projects and develop design suggestions in terms of traffic separation, lighting, landscaping, barriers, etc., to minimize the conflict between automobiles and children.

17. A CASE STUDY OF A COMMUNITY PARTICIPATION PROCESS FOR IMPROVING A NEIGHBOURHOOD TO BE MORE SUPPORTIVE OF CHILDREN AND YOUTH.

The case study will identify the process of community participation, the mechanisms available, the problems faced, and the resources tapped, and will serve as a model for other communities.

18. ADAPTATION OF CMHC DESIGN GUIDELINE ADVISORY DOCUMENT "PLAY OPPORTUNITIES FOR SCHOOL AGE CHILDREN, 6-14 YEARS", TO MUNICIPAL LEGISLATION

An example or model policy guideline on planning for play for school age children that is applicable to the municipal residential development control approval process and is written in such a way as to be easily adopted by municipalities.

19. MANAGING URBAN SPACE IN THE INTEREST OF CHILDREN

The proceedings of the International Symposium, dealt with the allocation of urban space to respect children's interests and the political, legal and socio-economic conditions required for various forms of organizations to function adequately. The report has been published by "Man and his Biosphere", the organizers of the symposium. Requests received will be forwarded to "Man and his Biosphere".

20. INCENTIVES AS AN AID FOR IMPROVING THE QUALITY OF THE FAMILY HOUSING ENVIRONMENT: A POSITION PAPER

The position paper will investigate alternatives which can serve as incentives to developers under the National Housing Act, to provide children's facilities within residential developments.

21. MONOGRAPH SERIES

Monograph one: Child Pedestrian Safety in Residential Environments.

Monograph two: Families with Children Living Off the Ground.

Other titles will be announced in the CEAS newsletter.